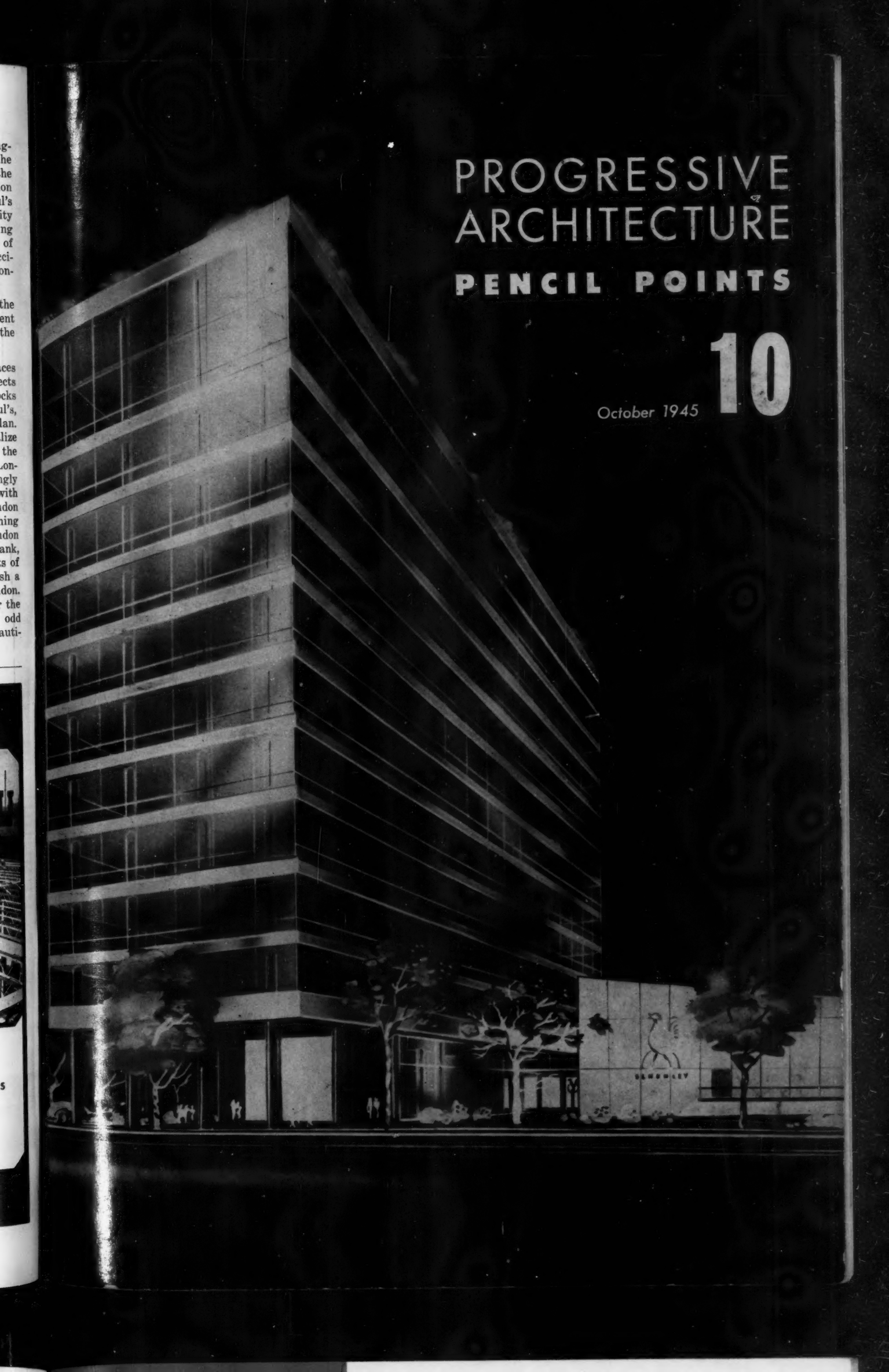


PROGRESSIVE ARCHITECTURE

PENCIL POINTS

October 1945 10

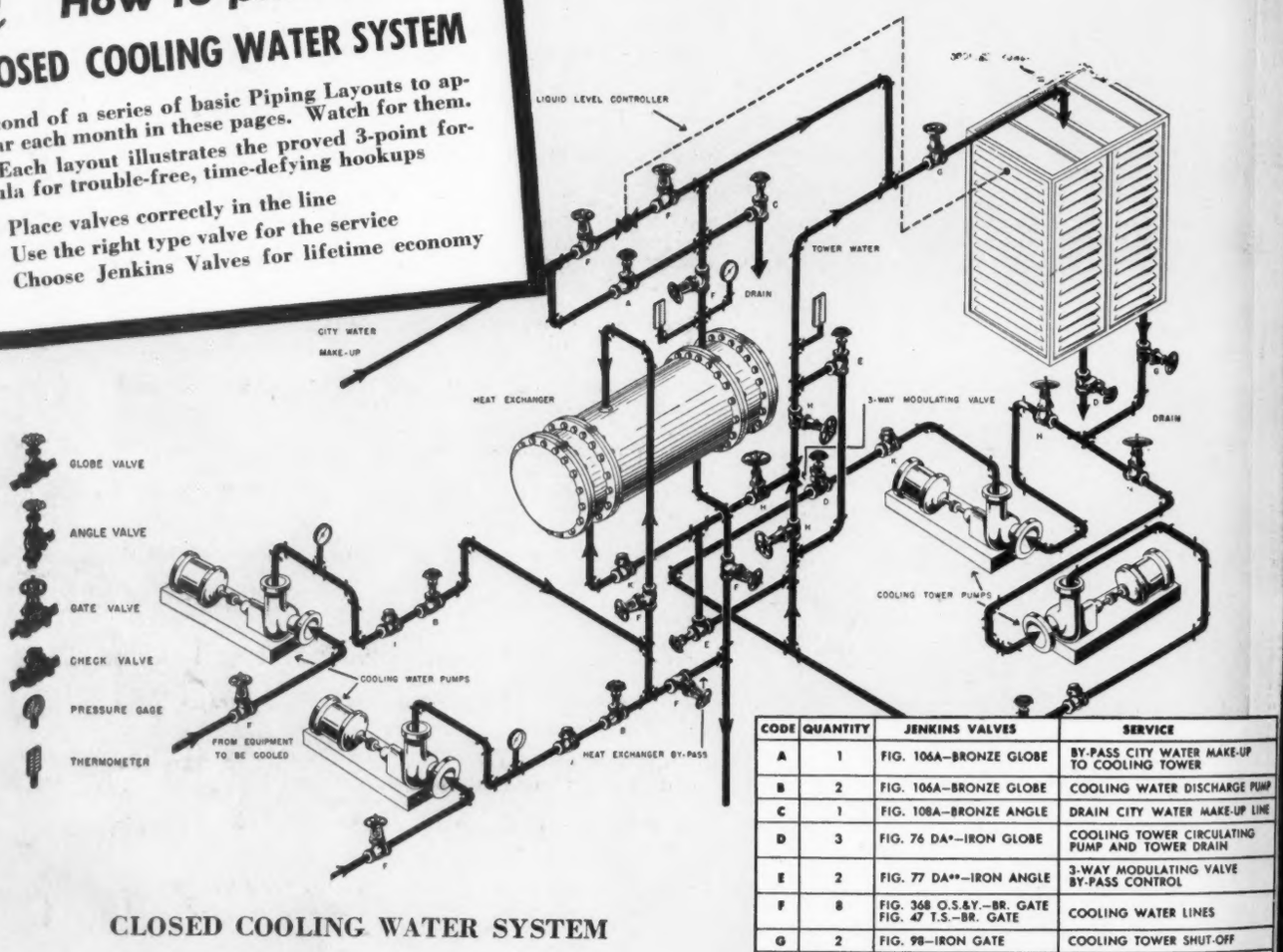
Jenkins PRACTICAL PIPING LAYOUTS 2

How to plan a CLOSED COOLING WATER SYSTEM

Second of a series of basic Piping Layouts to appear each month in these pages. Watch for them.

Each layout illustrates the proved 3-point formula for trouble-free, time-defying hookups

1 Place valves correctly in the line
2 Use the right type valve for the service
3 Choose Jenkins Valves for lifetime economy



CLOSED COOLING WATER SYSTEM

CODE	QUANTITY	JENKINS VALVES	SERVICE
A	1	FIG. 106A—BRONZE GLOBE	BY-PASS CITY WATER MAKE-UP TO COOLING TOWER
B	2	FIG. 106A—BRONZE GLOBE	COOLING WATER DISCHARGE PUMP
C	1	FIG. 108A—BRONZE ANGLE	DRAIN CITY WATER MAKE-UP LINE
D	3	FIG. 76 DA*—IRON GLOBE	COOLING TOWER CIRCULATING PUMP AND TOWER DRAIN
E	2	FIG. 77 DA**—IRON ANGLE	3-WAY MODULATING VALVE BY-PASS CONTROL
F	8	FIG. 368 O.S.&Y.—BR. GATE FIG. 47 T.S.—BR. GATE	COOLING WATER LINES
G	2	FIG. 98—IRON GATE	COOLING TOWER SHUT-OFF
H	5	FIG. 100—IRON GATE	COOLING TOWER WATER LINES
J	2	FIG. 352—BRONZE CHECK	COOLING WATER PUMP CHECK
K	3	FIG. 624—IRON CHECK	COOLING TOWER PUMP CHECK

COOLING TOWERS are frequently employed to reduce the expense of city water for installations using cooling water, such as air conditioning units, refrigerating systems, and Diesel plants. Many local building codes prohibit the use of water for cooling purposes unless a system is installed which permits the continuous re-use of the water. This layout meets these conditions, and also takes into account the absorption of corrosive elements into the tower water from smoke-laden atmosphere.

MANY TYPES AND PRESSURE RANGES of Jenkins Valves, other than those listed here, are suitable for a Closed Cooling Water System, according to the nature of the intallation. Jenkins recommends consultation with accredited piping engineers and contractors, either when adapting these suggestions to your own requirements, or when planning any major piping installations.

COPIES OF THIS LAYOUT No. 2, with additional explanation of all valve specifications, will be sent on request.

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PROGRESSIVE
ARCHITECTURE
PENCIL POINTS

October, 1945

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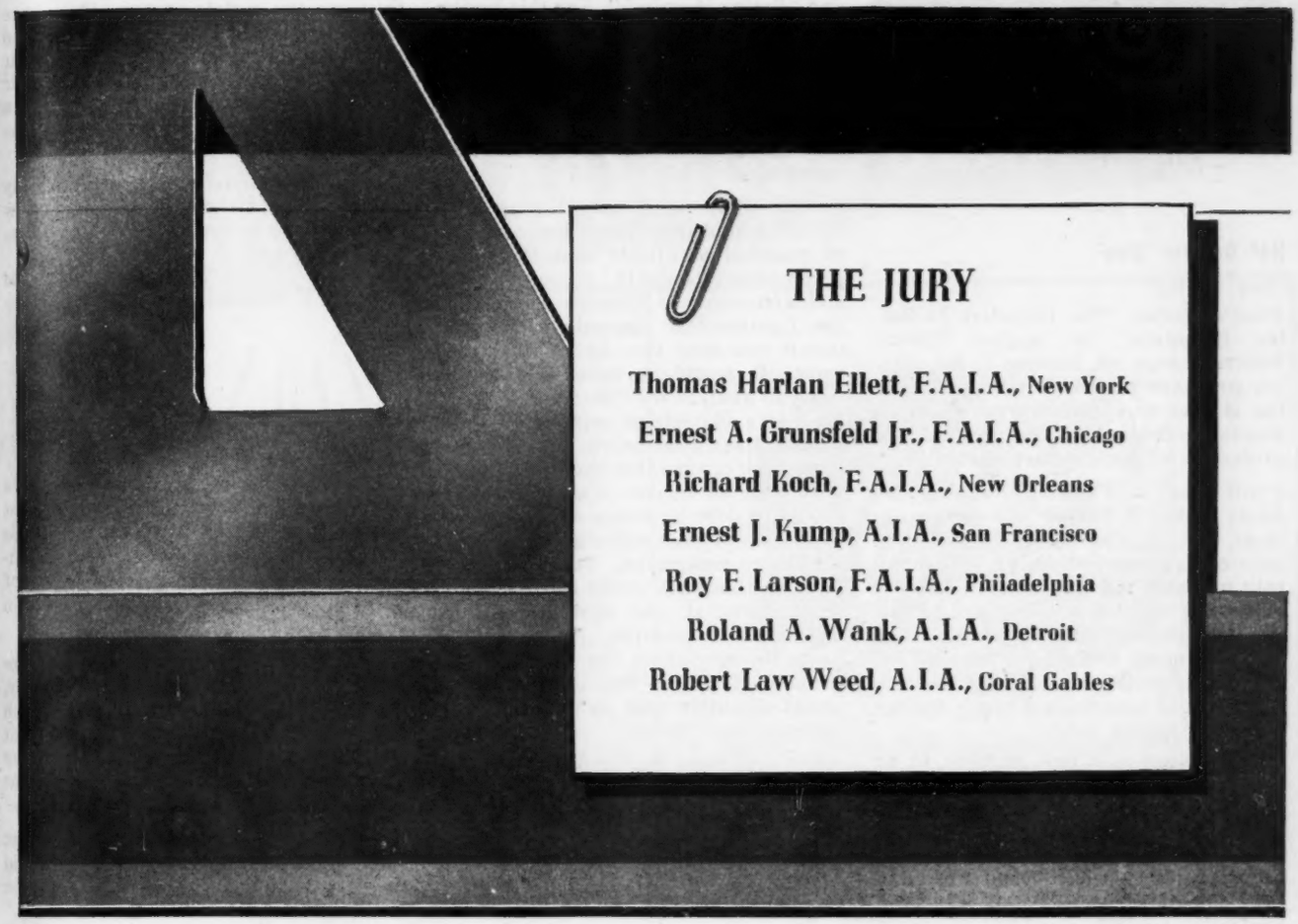

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Views

Not On Our Side

Dear Editor:

Your editorial, "The Objective Is Better Hospitals," in August PENCIL POINTS annoys me, because in my opinion you have placed your magazine on the side of this controversy where no magazine devoted to the good of the profession of architecture should be.

I will admit that having designed hospitals makes it *"easier"* to design another, but it also makes it easier to turn out stereotyped design and to repeat mistakes made before. It *does not guarantee* that the building will be better than one designed by an architect who has never designed a hospital before. It is quite probable that the neophyte might contribute a much fresher approach to the field.

Any building is a new problem to an architect and it is part of his business to study and analyze the problem it presents. If an architect is to be deprived of his opportunity to design his *"first,"* whether it be a hospital or other type of building, then how low has our profession sunk.

I sincerely think that the idea of a list of *qualified* architects to design hospitals is vicious and that the A.I.A. Board of Directors made a mistake to have anything to do with it. And we have designed hospitals in our office. I have discussed this question with at least a score of architects and not one of them has disagreed with me.

ALLAN H. NEAL, A.I.A.
Pittsburgh, Pa.

For Specialization

Dear Editor:

Your editorial in the August issue presents admirably a progressive step towards "Better Hospitals." May I endorse the plan of qualifying architects for hospital work. We must all agree, in this era of tremendous advancement in medical science, that the housing of medical patients, clinics, and laboratories is a specialized problem for architecture. The knowledge of medicine has become so broad that medical specialization is almost mandatory; and with increased speed of travel, the general practitioner will soon be an obsolete title.

The architect must be prepared to study hospital design, construction, layout, sanitary materials, and mechanical systems if he wishes to keep up-to-date with the ever-increasing discoveries in medical science and sanitation. The experience and mistakes of one hospital must be a stepping stone to the next and "Better Hospital." For this reason alone, our hospitals must be designed and built by specialists in hospital architecture and not by general practitioners. Let no architect fumble around with the design of a hospital if he lacks this special technical background and experience.

On the other hand, may I suggest to the AHA that they insure for the roster of qualified architects that their hospital *superintendents, managers, and administrators* be likewise qualified in the fundamental elements of hospital layout and that they know what they want. It would be beneficial for the AHA to analyze the "Better Hospitals" from an architectural point of view and publish their good points and mistakes, from time to time, for the benefit of all who wish to become specialists. This should be done by means of an unbiased discussion of each manufacturer of materials or equipment. To go one step further, the AHA would be wise to endorse material and equipment which meet their standards. To train and guide the specialists, the compilation of graphic standards for hospital design would eliminate poor design and would promote good design.

Architects must not (and will not) fail to prepare themselves for hospital work in the great medical program ahead of us. Let no architect who qualifies for the AHA roster sit back and cease his studies, for he will be out-of-date in no time. The long progressive strides being made in the medical profession must be matched with hard work and study of qualified men in the architectural profession if American hospitals are to excel.

CAPT. C. HERBERT WHEELER, JR.
Camp Shanks, N. Y.

Come In—Norway

Dear Editor:

Things are not as bad here as we had expected; but we had expected things to be very, very bad.

How about some of us American architects "adopting" a Norwegian architect as our personal contact in Norway by sending him a (free) year's subscription of an American architectural magazine, and otherwise let him know through letters, etc., what we are doing and thinking architecturally in America. There is enough money here, but reading matter has been entirely absent during the visit of the Herren Volk. Who knows but maybe such a sign of friendliness may work out to an invitation to Norway some day. It is a beautiful country with lots of good fishing, sailing, mountain climbing, etc. The idea could, of course, be worked for the benefit of any country over here.

Incidentally, one main stumbling block over here for the use of American engineering data is our use of the foot and inch system. These people would much rather use American "dope," but since they use the metric system, they have to use German! Too bad, they say, and they want us to change into the metric system. You do not suppose that while the Germans have lost this war by a *mile* they may win it in years to come by a *meter?*

Something to think about. We probably ought to adopt the metric system now that we have to reconvert all of our industry anyway.

MAJ. E. K. MAHLUM
U. S. Mission, Norway (Military)

Humaneness as a Dividend

Dear Editor:

I happen to be on my last week of a project which is slowly petering out and so have enough time on my hands to read, more leisurely and philosophically, through the few recent issues of PENCIL POINTS that I happen to have in my files.

As I re-read your editorial "Environment for Work" in the March number, I notice that in your third paragraph you come to the conclusion, somewhat reluctantly and sadly, that "thus, the urge to profit accomplishes ends that simple humanity could not reach!"

But I am equally impressed by the fact that the deplorable conditions described in your first paragraph were also the result of this same "urge to profit," and, as I roll a new cigarette, admire its perfect shape, and proceed to light it, I ponder as to the nature of this "urge to profit" which apparently can accomplish such diametrically opposite results.

The implications in your editorial are that the "urge to profit" boys had to have it knocked into their silly heads that they can make as much money out of improved conditions as they could out of the abominable conditions created by their own stupidity. They thus show themselves to be standing squarely in the way of progress, because they will accept improvement only when they can see that it gives them a chance to make more money.

This is hardly an inspiring credo for an architect who is a thinking being and a creative artist. Your last paragraph comes nearer to the truth. Where the architects should stand on this issue would take more room than can be allowed in a letter from

SILVIO ZANETTI
Camden, Arkansas

Postscript To July VIEWS

Dear Editor:

What a lot of grouches write letters to the Editor in PENCIL POINTS! I thought the mossbacks had been dying off.

LEWIS MUMFORD
Amenia, N. Y.

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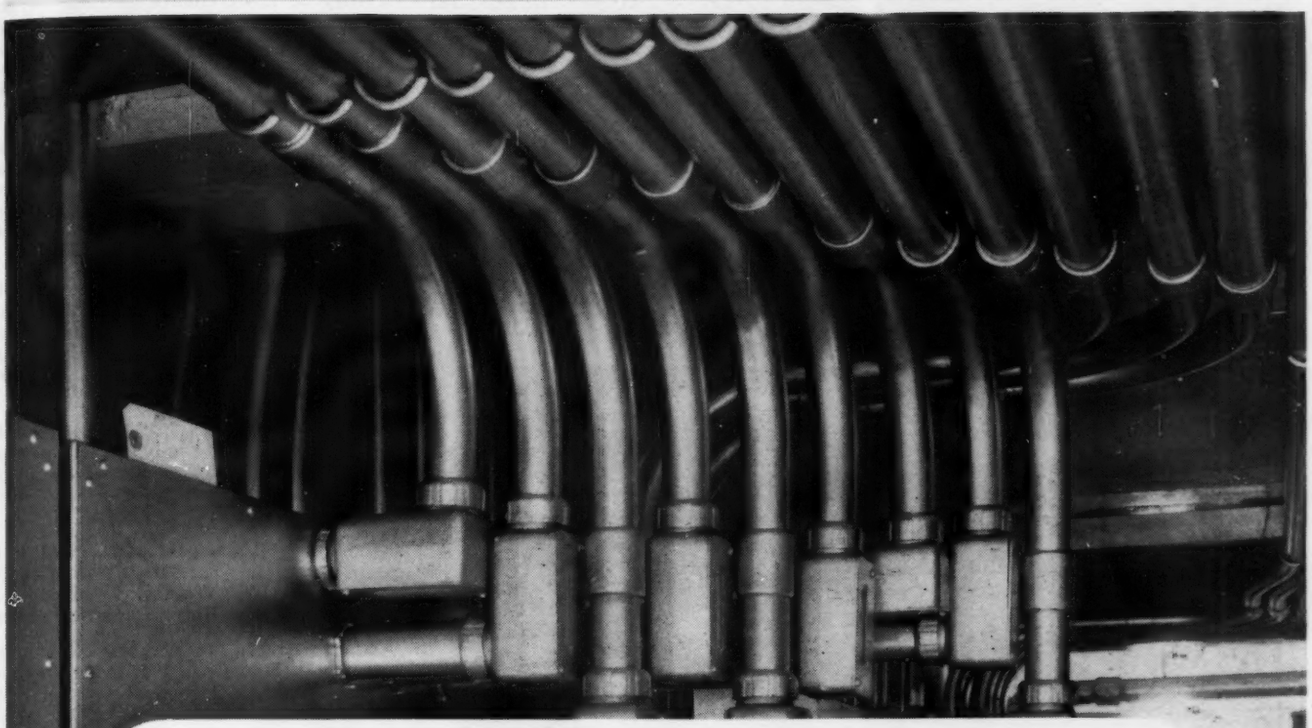

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Views

(Continued from page 10)

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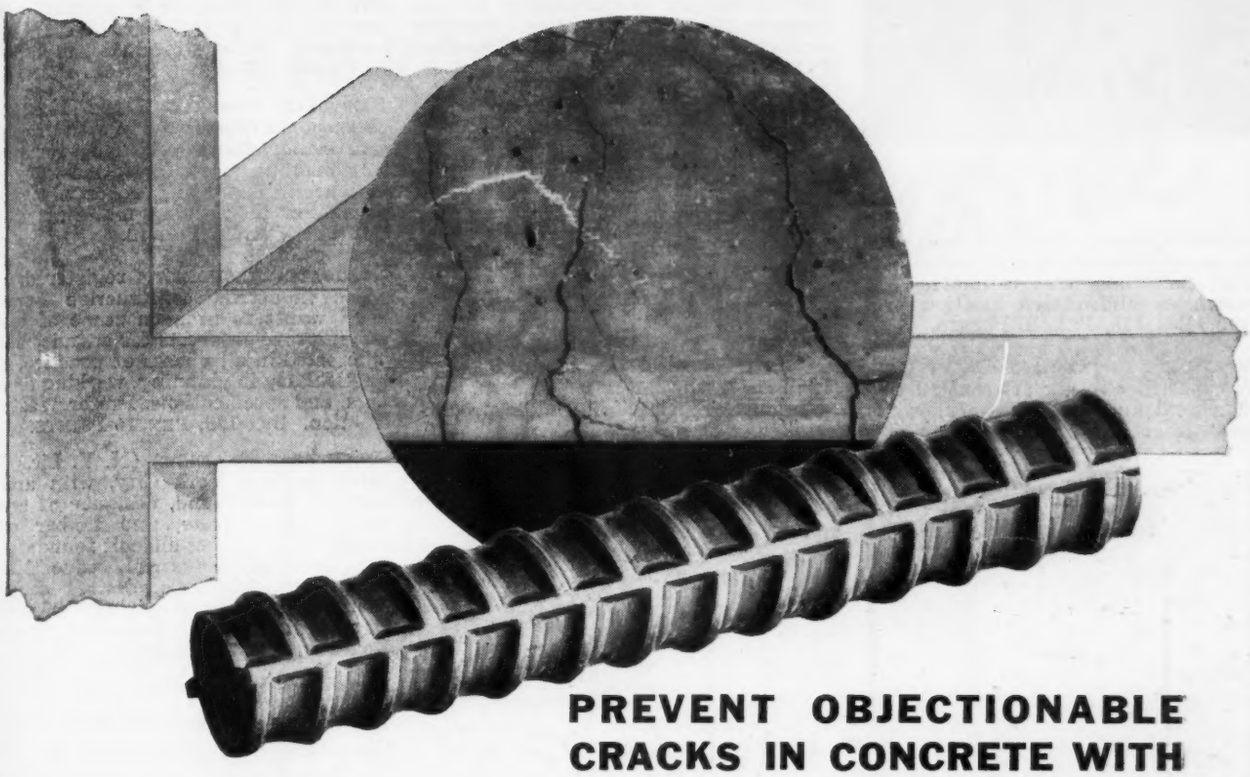
(Continued on page 14)



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INLAND HI-BOND

Views

(Continued from page 12)

and New Orleans. Four years experience as specification writer, estimator, bill of materials, cost estimates, etc. Western or Midwestern location preferred. Box 178, PENCIL POINTS.

COMPETENT DESIGNER AND DRAFTSMAN, with experience in airport construction and general architectural work, wants position leading to partnership in progressive office or corporation. Western or Southern location preferred. Box 180, PENCIL POINTS.

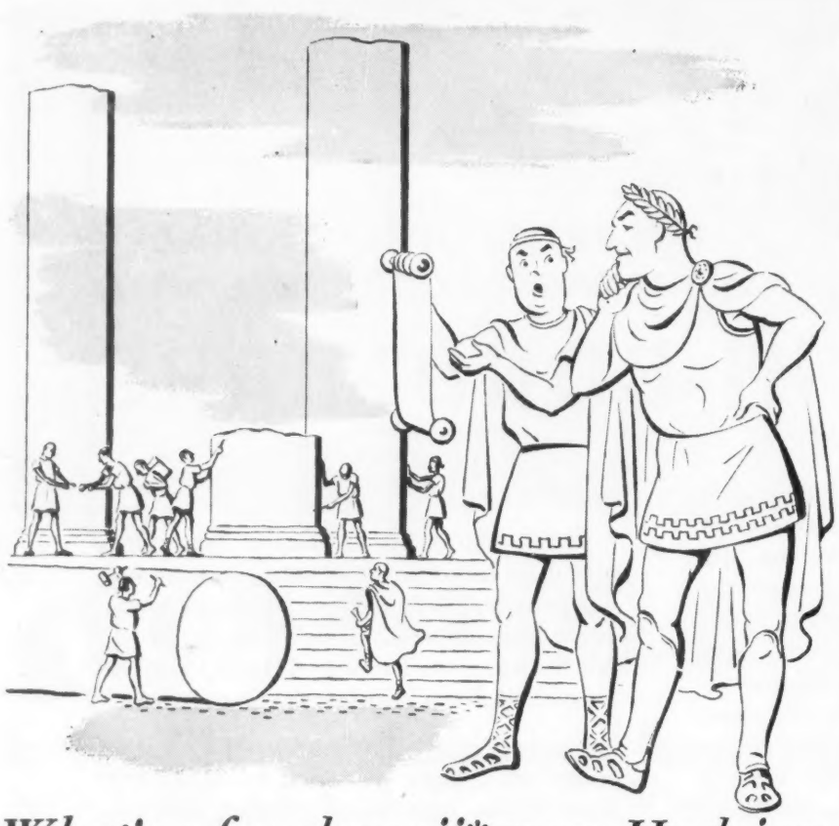
COMPETENT ARCHITECTURAL DRAFTSMAN-DESIGNER desires employment with a future. Prefers Northeastern or Midwestern state. B.S. Building Construction and B. S. Arch. Past three years chief draftsman and designer Army Air Field. Efficiency rating excellent. Capable designing and developing preliminary and working drawings; detailing, rendering; surveying; profile, topographic drawings. Box 185, PENCIL POINTS.

ARCHITECT—30—desires connection with progressive prefabrication concern. Considerable experience in mass production as "B" Designer in aircraft engineering during the war. West Coast preferred. College graduate, registered in Florida. Box 186, PENCIL POINTS.

EMPLOYED GENERAL SALES MANAGER seeks greater opportunity with progressive manufacturer preparing for postwar building market. Nation-wide experience in marketing, advertising, and promotion in building materials field. Box 188, PENCIL POINTS.

GRADUATE ARCHITECT, registered, 13 years industrial construction experience, wants to broaden scope of work and improve prospects for advancement. Interested in all phases of practice, but particularly in planning, working drawings, and specifications. Prefer Western location. Box 189, PENCIL POINTS.

STRUCTURAL ENGINEER (N. Y. Lic.) located in New York City, with architectural background, designer of steel, reinforced concrete, and timber construction, including difficult foundations for housing, industrial, educational, commercial buildings, desires connections with offices requiring competent structural services. Inquiries invited. Box 190, PENCIL POINTS.



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NOTICES

DOMINICK SALVATI, Architect, announces the relocation of his office at 26 Court St., Brooklyn, N. Y. His son, ANTHONY MARK SALVATI, will be his associate.

W. J. DANIEL INTERIORS, INC., take pleasure in announcing the opening of their studio and showroom under the management of W. J. DANIEL, 113 E. Oak St., Chicago 11, Ill.

H. GEORGE FINK, Architect, has reopened his studio in the Terminal Building, 204 Aragon Ave., Coral Gables, Fla.

KUHN & NEWCOMER announce the opening of their office at 508 Third Ave., Pittsburgh, Pa., for the practice of architecture.

MATTHEWS M. SIMPSON, Architect, announces the reopening of his office at 360 Springfield Ave., Summit, N. J.

ISADORE ROSENFIELD, architect and hospital consultant, announces the opening of an office at 19 West 44th St., New York 18, N. Y.

ROY B. BLASS, Architect, announces that his offices are now at 30 N. La Salle St., Chicago, Ill.

HENRY F. LUDORF, Architect, announces the removal of his office to 100 Pearl St., Hartford 3, Conn.

CLARK R. ACKLEY, Architect, announces the removal of his offices to 1811 East Michigan Ave., Lansing 12, Mich.

JOSEPH DOUGLAS WEISS, Architect, announces the removal of his office to 8 West 40th St., New York 18, N. Y.

WILLIAM A. DEAN, town planner and landscape architect, announces the removal of his office to 1509 West Jackson Blvd., Chicago 7, Ill.

DAVID M. WARD AND WILLIAM H. CONRAD announce the opening of an office for the practice of architecture at 702 Swetland Bldg., 1010 Euclid Avenue, Cleveland 15, Ohio.

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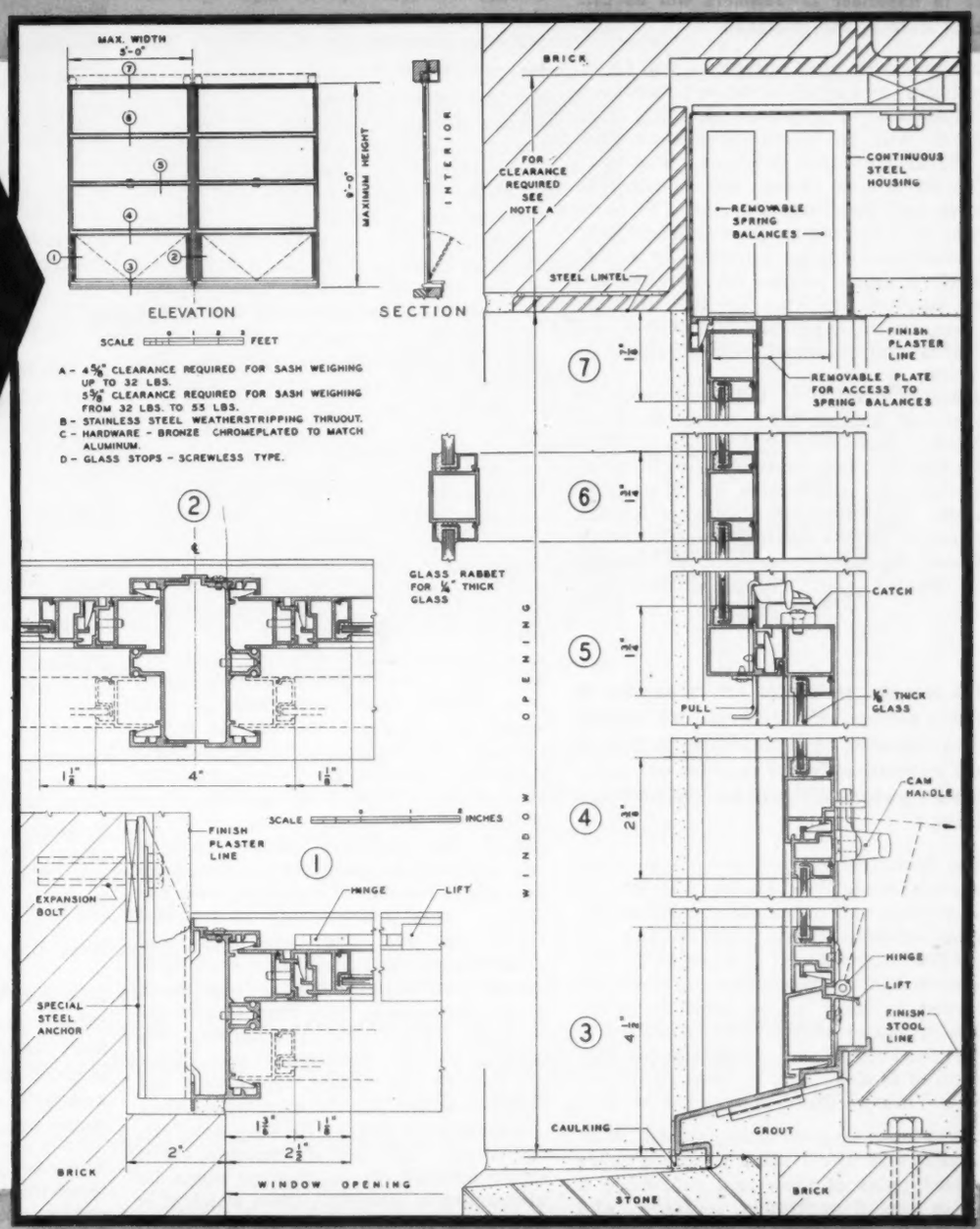

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News

The Massachusetts Institute of Technology has scheduled its ninth annual Conference on City and Regional Planning, from October 22 to November 2. Seminars will be held each morning and afternoon.

Emphasis in the Conference will be on technical and administrative procedures. Application of approved planning standards will be discussed—rather than general planning problems. The Conference is open to men and women who have had practical experience in planning or a related professional field. The Conference will be followed by a ten-week training course for development of specific problems in the drafting room, with supplemental library research and round-table discussions.

Those interested in the Conference or training course may write to Prof. Frederick J. Adams, Division of City Planning, Massachusetts Institute of Technology, Cambridge 39, Massachusetts. In addition to Professor Adams, the staff for the Conference will include Flavel Shurtleff, Homer Hoyt, Roland B. Greeley, and visiting lecturers.

The Museum of Modern Art is anxious to secure photographs, dates, and full descriptions (including an exact account of location and material) of "really excellent war monuments anywhere, but particularly in the United States."

The Museum proposes to hold an exhibition of models and photographs of war memorials and to publish a book on the same subject. There is special interest in obtaining material relating to smaller monuments, as these are not as well recorded as some of the more imposing works. Material should be submitted to the Department of Architecture, Museum of Modern Art, 11 West 53 Street, New York 19, N. Y.

"Broadcasting good examples will show localities in the United States a more varied point of view and encourage a wider use of architects, sculptors, and landscape architects," we are told by Philip L. Goodwin, Chairman of the Museum's Architecture Committee. A book on war memorials is to be prepared by Philip Johnson, former Curator of the Architecture Department, now practicing architecture in New York. After the collected material is shown in New York, it will be circulated throughout the country as a traveling exhibition.

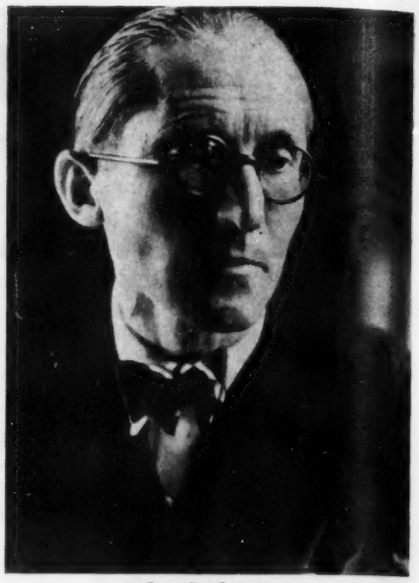
The varied activities of Le Corbusier in the fields of architecture, city planning, painting, and writing are summarized in an exhibition currently on view at the International Building, Rockefeller Center, in New York, sponsored by Ambassador Henri Bonnet of France.

Offered as a prelude to a scheduled visit of Le Corbusier to this country within the next few weeks, the exhibit encompasses reproductions and models of his buildings, his oil paintings, gouaches, drawings, posters, books and excerpts of his writings over a period of 25 years. Material for the exhibit was contributed by the Museum of Modern Art, by John Becker of New York, and Carl O. Schniewind of Chicago. It was collected and assembled by the Walker Art Center, Minneapolis.

By no means "accepted," even by critics in his own country before the war, Le Corbusier seems to have achieved sound recognition in the past few years. He was one of eight distinguished architects chosen by the Ministry of Reconstruction to serve as a Supreme Council of City Planning in guiding public works (PENCIL POINTS, June 1945). Previously he had founded, during the war years, Ascoral, an organization devoted to architectural research. The membership includes men of scientific and planning fields related to architecture—described by Le Corbusier as "the workers of all ages."

Interviewed some months ago by Jean Gallotti for *Nouvelles Littéraires*, the noted French architect suggested that modern cities built on a scale radically different from that of the past would bring whole nations closer together and help prevent recurrent wars. He advocated decentralized cities, spread out over wide areas to give breathing space, cities which would form web-like networks over Europe. He told the interviewer: "We must dare to face reality. Recently I attended the French Aviation Conference. There I learned that engineers are perfecting a series of cargo planes and airliners whose landings will be controlled from the ground by an apparatus capable of directing, over the airport, an airplane every 16 seconds. Don't you feel that such technical achievements will accentuate even more the anomaly of our everyday lives? Look at the situation in both the city and the country. The rural populations are moving into the 'tentacular' city. They are leaving the village, where they are bored to death, for the city, where they are choked to death. Seeking comfort, recreation, and social contacts, man shuts himself up in clusters some 50 kilometers in diameter, from which it is impossible for him to get out to breathe, to walk, to enjoy nature. Shall we allow this evil to increase?"

His remedy is to group villages into cooperative centers so that country dwellers may share community facilities; to reduce the size of cities by decentralizing industry and distributing the population along the course of highways and railroads until a network is formed. In the interstices would be preserved the beauty of "open country, villages, fields, and forests."



Le Corbusier

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To free their city of the smoke-soot nuisance, town fathers of Chisholm, Minnesota, have voted for a central heating plant that will outlaw individual furnaces—and also reduce the town's fuel consumption.

Central steamheating is in use in downtown and industrial areas of large cities, but Chisholm seems to be the first town to enact legislation that will provide city-wide central heating as a postwar project.

Preliminary estimates indicate that the fuel consumption in Chisholm will be cut approximately 25%. It also is pointed out that new homes will not require the extra outlay for basement excavation and construction. In the older houses, removal of furnaces and fuel storage will give extra basement space. The plant and distribution lines are to be constructed as soon as necessary materials are released.

Lest there be planning committees or public officials unaware of the value of the architect's contribution in a postwar planning program, Massachusetts State Association of Architects has sent throughout that State a timely Circular of Information.

The architects' services in relation to those of other branches of the planning professions are not always understood, it is found. Mayors, selectmen, and others responsible for postwar projects are therefore invited to "obtain information without involving any obligation" from the Secretary, Boston Architectural Center. The circular was prepared by the Committee on Education, M.S.A.A. and has been endorsed by the

(Continued on page 18)

Specify Tile-Tex Asphalt Tile for Key Rooms in Homes

This modern *kitchen has a* modern *floor of Tile-Tex Asphalt Tile.*

Key rooms of a home invariably are the kitchen and the bathrooms. Architects are therefore increasingly selective in specifying materials and equipment for these two rooms, so important to the mistress of the home.

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News

(Continued from page 16)

Boston Chapter, A.I.A. The help is offered "because the architects are mindful of their obligation to the public and are interested in preventing ill-advised expenditures."

Planning committees and individuals "usually avail themselves of the services of architects for the design and direction of the execution of building projects or other community improvements. Unfortunately many do not engage the architect in time to avail themselves fully of his experience in the formulation of the program and in site planning.

"Most communities, many firms and individuals are now engaged in the preparation of long-range plans for a building and improvement program for the postwar period. In many instances, they have already listed postwar projects and prepared a program for capital outlay. In some cases the building site selections and the preparation of an outline of requirements for the buildings have been completed or are in progress. In a few fortunate instances, architectural plans have been finished. Federal funds are now available to municipalities for the preparation of plans."

The illustrated talk on dimensional coordination presented recently by A. Gordon Lorimer, Chief of the Bureau of Architecture, Department of Public Works, New York, before a series of meetings of architects and material producers has been filmed in color, with sound slides, for distribution throughout the construction industry.

The basic cost of producing the film, "A Scotsman Looks At Modular Coordination" (35 millimeter, 110 frames, one 12" disc record) was shared by the A.I.A. and the Producers' Council. Copies are available to trade groups, individual manufacturers, and others at the nominal cost of $75 for slide film plus records, including shipping charge. Those interested may write to The Producers' Council, Inc., 815 15th Street, N. W., Washington 5, D. C.

Lorimer shows in the film the need for coordination; gives examples of recent buildings which demonstrate the natural trend toward coordination; lists the group of building products (brick, clay tile, concrete masonry units, glass blocks, metal windows and wood windows) which will be available in modular dimensions; and illustrates some of the economic advantages.

A list of teachers available for immediate and postwar employment in schools of architecture is being compiled by the Secretary, Association of Collegiate Schools of Architecture.

Increased enrollments under the various Army Educational Programs are expected and there will be an urgent need for qualified teachers. Those qualified and interested in teaching positions for the next school year should send their personnel records to Prof. Paul Weigel, Secretary, A.C.S.A., Department of Architecture, Kansas State College, Manhattan, Kansas.

Day and evening classes to interest qualified special students, as well as mature students seeking degree credits, are being offered this fall by the School of Architecture, Columbia University.

At the time of registration, late last month, it was announced that the course includes classes dealing with construction, specification writing, and architectural materials. There are also classes in architectural design, history, and delineation.

As a springboard for the launching of new products and new designs a "Products of Tomorrow Exposition" is being planned in Chicago—to open early next year. The Chicago Coliseum and adjacent buildings will provide the exhibition space.

New building materials and methods will be shown the public next spring at a "Construction Exposition and Home Show" in Los Angeles, sponsored by the Chamber of Commerce and eight contractors' associations.

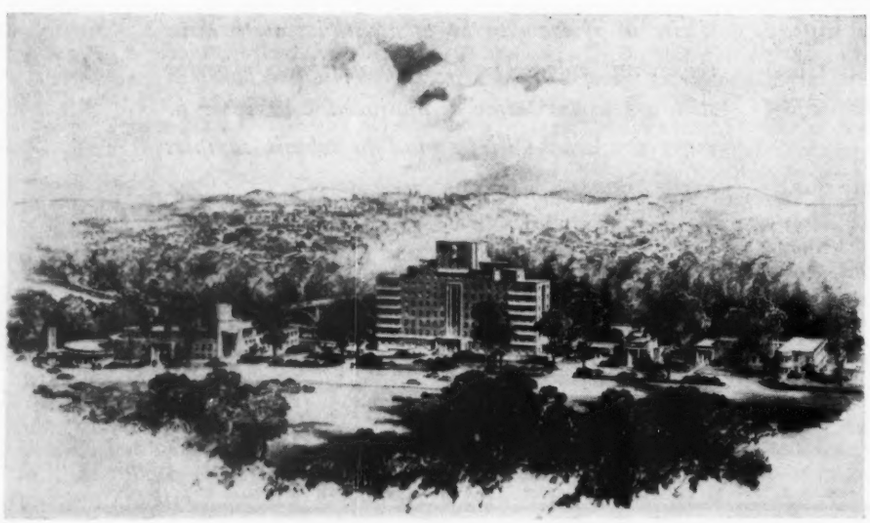
Winners of the competition for design of a tuberculosis sanatorium at Ballyowen, Lucan County, Dublin (PENCIL POINTS, January 1944) have been announced by the Dublin Corporation.

John G. Manahan and L. P. Peppard, both of Dublin, won the £500 first prize. Second prize, £350, went to Nicol, Nicol & Thomas and Donald G. Walton, both of Birmingham, England; third prize, £250, to Donald Dex Harrison and Miss Penelope Whiting, both of London; fourth prize, £150, to The Grenfell Baines Group of Architects, of Preston, Lancashire.

The Civil Aeronautics Administration has "no regulations" and "no restrictions" on starting a small airport, but it recommends adherence to certain standards of construction —now collected in a CAA publication, "Airport Design."

The CAA, actively interested in the safety of the flying public, also maintains a service to give advice and assistance to those who plan and build airports. There are airport engineers and CAA airport superintendents in the key cities of the country to whom those interested in airport design are invited to turn. Instructed to "foster and encourage the development of safer avia-

(Continued on page 20)



Prize winning design (left) in the East Tennessee Baptist Hospital Competition is by James R. Edmunds, Architect, of Baltimore. The 200-bed hospital is to occupy a prominent site high above the Tennessee River at Knoxville. Included are a doctors' building, a chapel, and a nurses' home. Prize awards announced by George S. Koyl, Professional Adviser, also included second prize to Barber & McMurry, of Knoxville.

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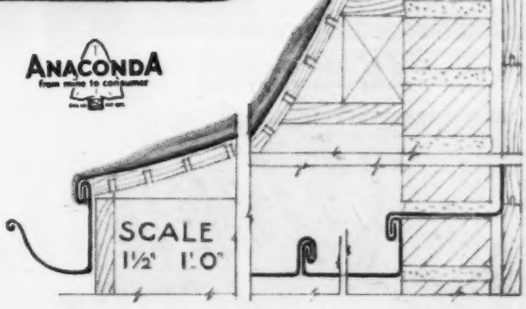

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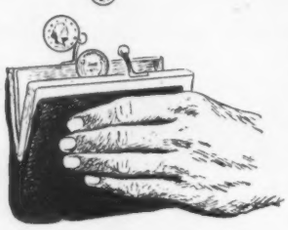

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AMERICA'S STANDARD FOR OVER 20 YEARS

News

(Continued from page 18)

tion," CAA believes that adherence to safety standards will go far toward popularizing civil aviation.

More than 200 airports now leased by CAA in 41 states as intermediate fields have been made available to local governments for use as municipal airports. Those taking over the fields are required to continue operations in accordance with CAA standards for emergency fields. No objection is raised to cities or towns contracting with commercial operators to run these fields.

Establishment of a scholarship fund in the School of Architecture, University of Minnesota, by the Flour City Ornamental Iron Company, of Minneapolis, has been announced by Prof. Roy Jones, head of the school.

In addition to providing money for students of outstanding ability, talent, and promise, the fund will furnish prizes for an annual competition in the design of metal work. The donor is known for metal work on buildings throughout the country.

OBITUARY

Paul Philippe Cret
1877-1945

Paul Philippe Cret, architect of international renown, died early last month in Philadelphia. Recipient of many professional honors and awards, he was also architect of public structures that will be regarded as monuments to his professional achievement.

One of the best known buildings by Cret is the Federal Reserve Board Building in Washington, D. C. Also in the national capital are his Folger Shakespeare Library and famed Pan American Union Building (in association with Albert Kelsey). His war monuments overseas, designed after he served as consulting architect to the American Battle Monuments Commission following World War I, are as well known. In Philadelphia, his work included the Rodin Museum, the Delaware River Bridge, the Valley Forge Memorial Arch, and a contribution to the Benjamin Franklin Parkway for which he received the Philadelphia Bok Award in 1931.

A native of Lyons, France, Cret graduated from L'Ecole des Beaux Arts in 1903. After coming to the United States, he was named Professor of Design at the University of Pennsylvania and served there until 1937, when he turned full attention to his private practice.

(Continued on page 22)

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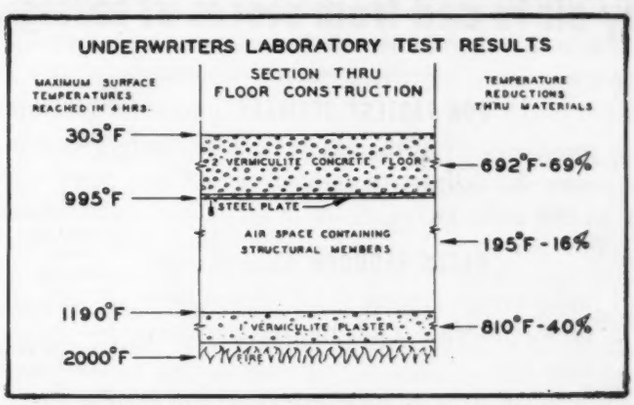

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News

(Continued from page 20)

New president of the Municipal Art Society, one of the oldest art organizations in New York, is Charles C. Platt.

Other new officers are Alfred Geiffert, Jr., vice president; A. F. Brinckerhoff, secretary; and Fletcher Collins, treasurer. The society embraces all the arts and its membership includes artists from every field as well as lay members interested in the fine arts.

At the outset of the fifty-third year of the society, Platt announced "its program for the coming year is a full one for the development, encouragement and advancement of all the arts throughout the City."

New director of the College of Fine Arts, Carnegie Institute of Technology, is B. Kenneth Johnstone, former head of the Department of Architecture, Pennsylvania State College. He assumes his duties November 1, succeeds Glendinning Keeble.

As president of the Central Pennsylvania Chapter, A.I.A., and treasurer of the Pennsylvania Society of Architects, Johnstone has been prominent in professional activities. He also is the author of articles in the professional press and of a recent book, "Building & Buying a House," prepared in collaboration with his associates at Pennsylvania State College.

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Earl E. Burkhard, real estate management expert with a long background of both public and private housing management, has been appointed General Housing Manager for the Chicago Housing Authority.

Lorimer Rich, Architect, announces that LT. COL. ROBBINS L. CONN, recently of the Army of the United States, is now associated with his office, 215 Montague St., Brooklyn, N. Y.

L. C. Dillenback, director of the School of Architecture, Syracuse University, has been named dean of the College of Fine Arts by CHANCELLOR WILLIAM P. TOLLEY. He succeeds DEAN HAROLD L. BUTLER, retired.

Walter Dorwin Teague, Industrial Designer with offices in New York and Los Angeles, has taken two of his associates into partnership. ROBERT J. HARPER, who joined Mr. Teague's organization in 1935, is now Director of Design in the New York office and C. STOWE MYERS, who has been with Mr. Teague since 1934, has the same responsibility in the Los Angeles office.

REMEMBER TO PLAN FOR SAFETY

The most obvious and generally accepted things in the world are the very ones we all need to be periodically reminded about.

Take, for example, the matter of safety as a factor in the design of buildings. Every architect knows that he must exercise constant forethought to guard against the many hazards that can be involved in the use of the structures he creates. Yet the records compiled year after year show a startlingly large number of accidents, many of them fatal, that might have been prevented had the designers of buildings been just a little more thoughtful.

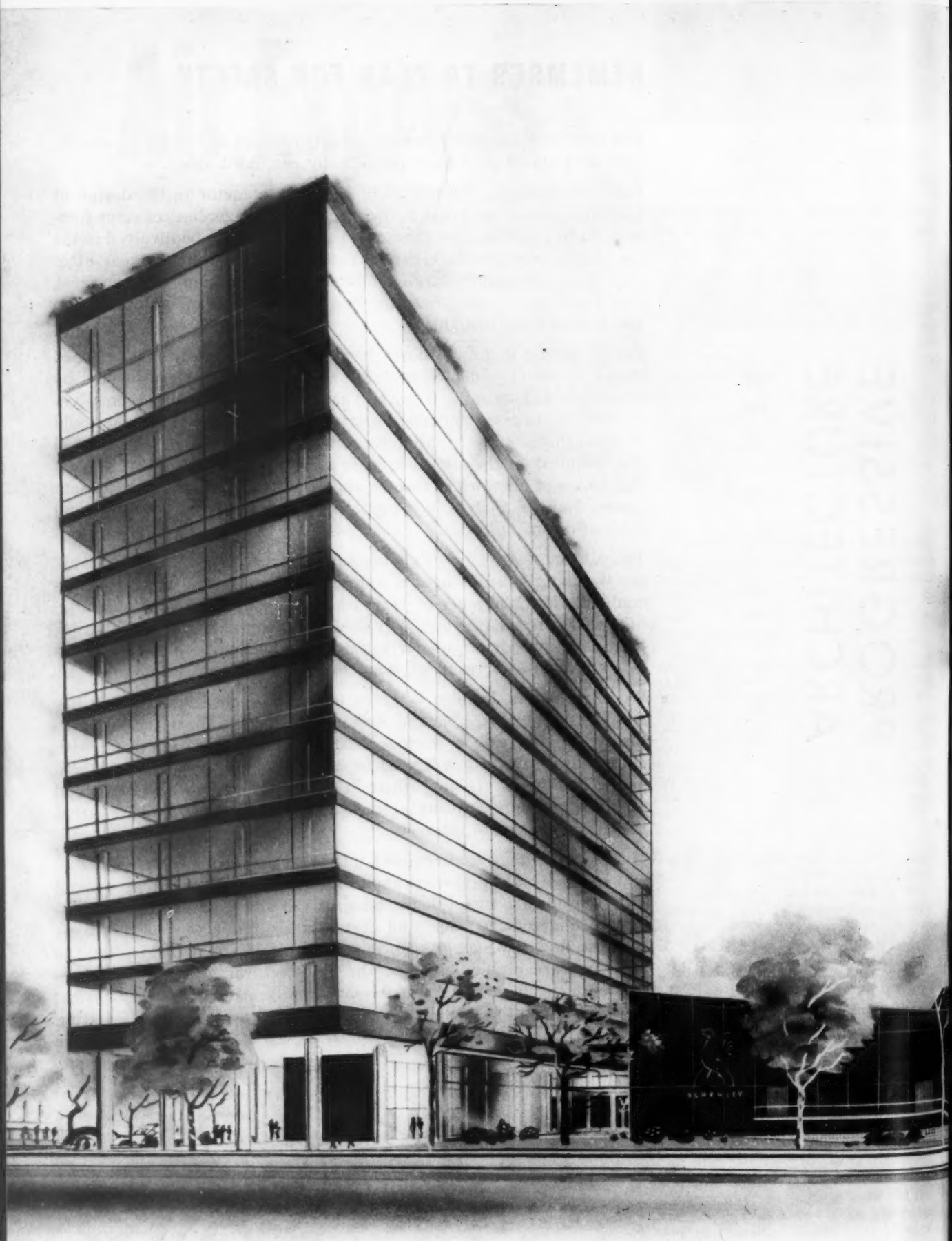
People persist in falling down badly lighted or poorly proportioned stairs, or out of windows, or into areaways improperly protected by guardrails or handrails. They still succeed in electrocuting themselves in buildings in an astonishing variety of ways. To say that they would do these things anyway through carelessness is no answer. It is a real responsibility of the architect to do everything he can during the design phase of his work to foresee and provide against the omnipresent human failings that allow people to disregard simple warnings and rules of common sense.

The subject of safety is of particular importance right now. Not only are we about to enter upon a huge building program which will undoubtedly last a number of years and add thousands of new building hazards to the existing ones, but we are confronted with a much larger than usual proportion of our population who will be handicapped in getting about as a result of wounds suffered during the war.

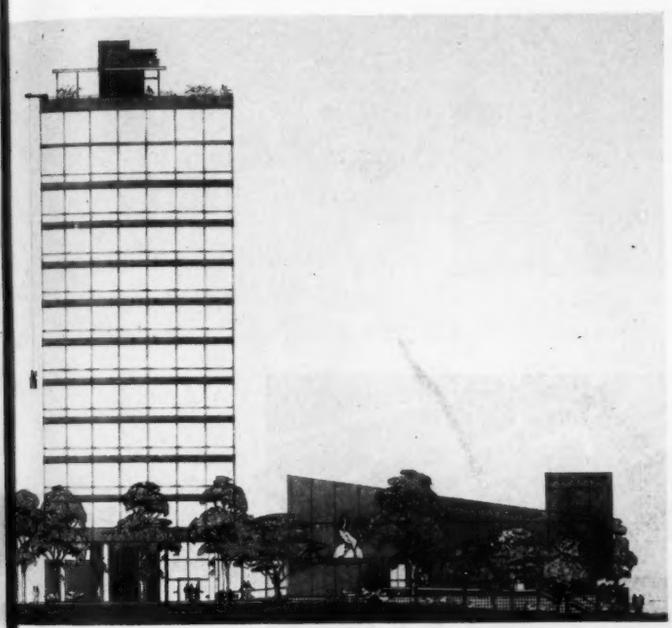
We all want the disabled veterans to be reabsorbed into civilian life as completely as possible and we all want to give them every opportunity to participate in business, industry, and recreation along with everybody else. They will need to enter offices, factories, stores, and public buildings. During their leisure they will want to attend theaters, museums, sports arenas, churches, libraries, and a great many other places of interest.

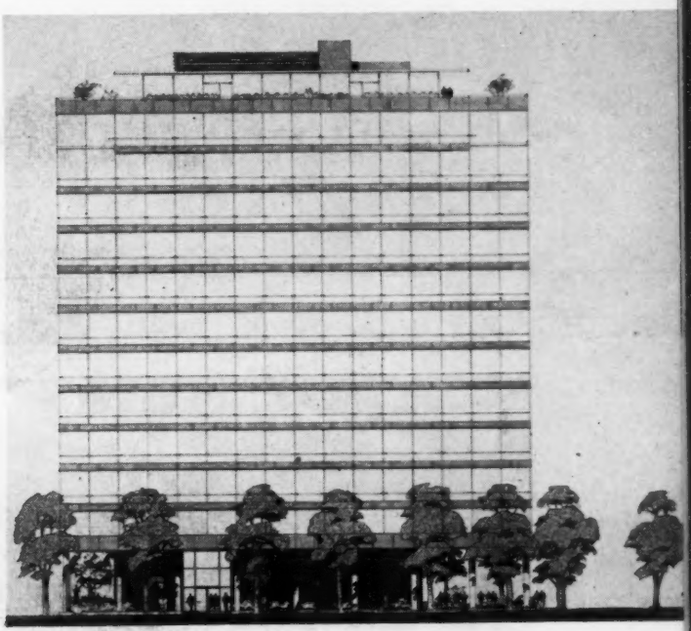
Much can be done to safeguard them and make their movements in and around buildings easy and comfortable. Entrances at ground level, elevators between floors, handrails at all steps, and the elimination of unnecessary steps and obstacles are but a few of the items that the designer should keep in mind. Let it not be said after the buildings are already up that the architectural profession has neglected to insure against unnecessary bodily injury or even physical discomfort for the men to whom we owe an admittedly everlasting debt. In making things better for them we may find that we have made them better for all.

Kenneth Reid



PROPOSED OFFICE BUILDING





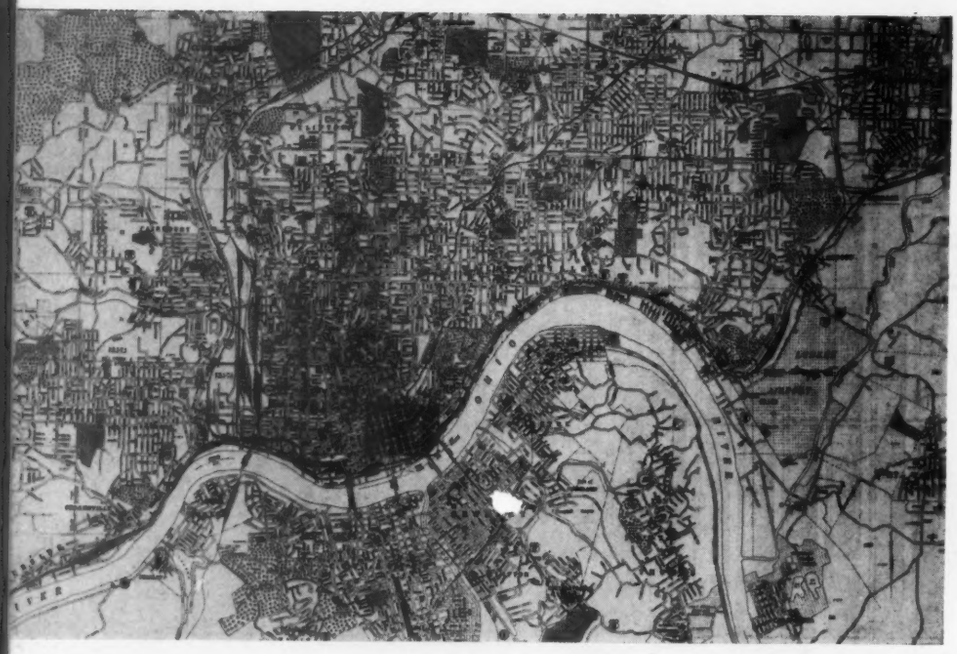
For Schenley Distillers, Inc., Cincinnati, Ohio

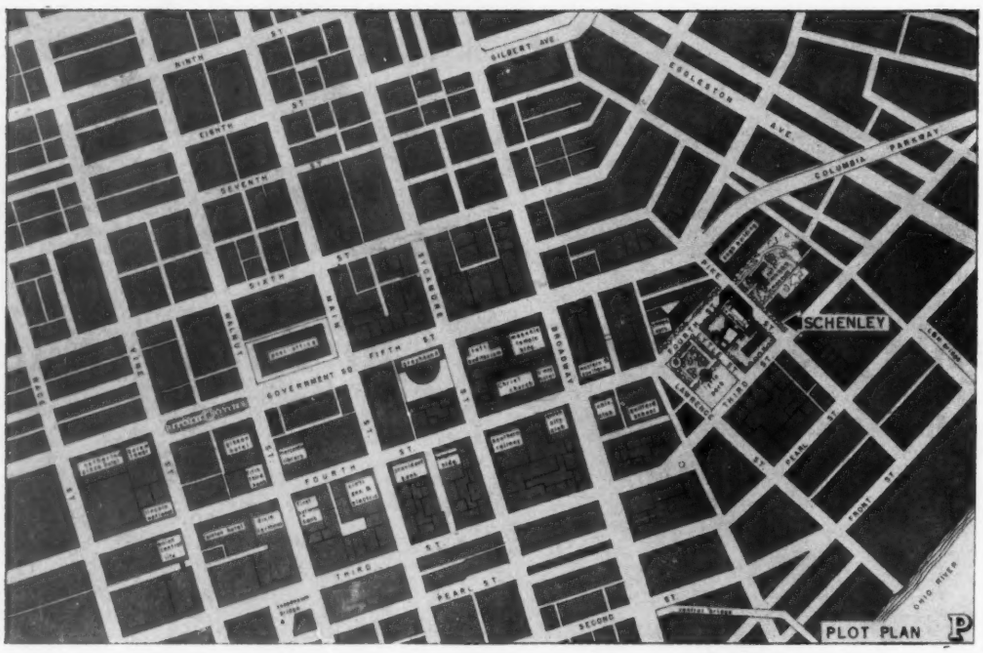
Woodie Garber, Industrial Designer

Foreword

The design of this proposed building was of a speculative nature with the ultimate hope that it would be erected by others for long-term occupancy by Schenley Distillers, Inc. The designer, therefore, was not selected by Schenley; nor were the preliminary drawings done at their request; nor, indeed, did Schenley see the drawings until they were finished. The corporation did, however, provide a statement of its basic business requirements—uses to which they would put such a building, facilities and space needed, and general character desired—which was the reference point used in the development of the design.

Schenley has made no commitments of any kind to construct this building according to these plans at the present time. It is, however, such a remarkable example of progressive architecture—we would be the first to cheer should the corporation decide to proceed with this scheme, or something like it—that we choose to make it our major presentation this month, and to discuss it in considerable detail for the instruction and inspiration of others who may be commissioned to design office buildings. In every respect—planning, design, construction, equipment, and facilities for employes—this building represents a sincere attempt to improve existing standards; to restudy the fundamental needs in the design of a good office building for tomorrow and to translate these needs, through the new methods and materials which modern technology provides, into vital architecture. So far as we know, this is the most progressive office-building design yet to appear in this country.





Above: map of Cincinnati showing location of project, and downtown Cincinnati, showing exceptional site. Left: the Taft Museum, a next door neighbor.

Right: present condition of site, and, above, Lytle Park, another next door neighbor.

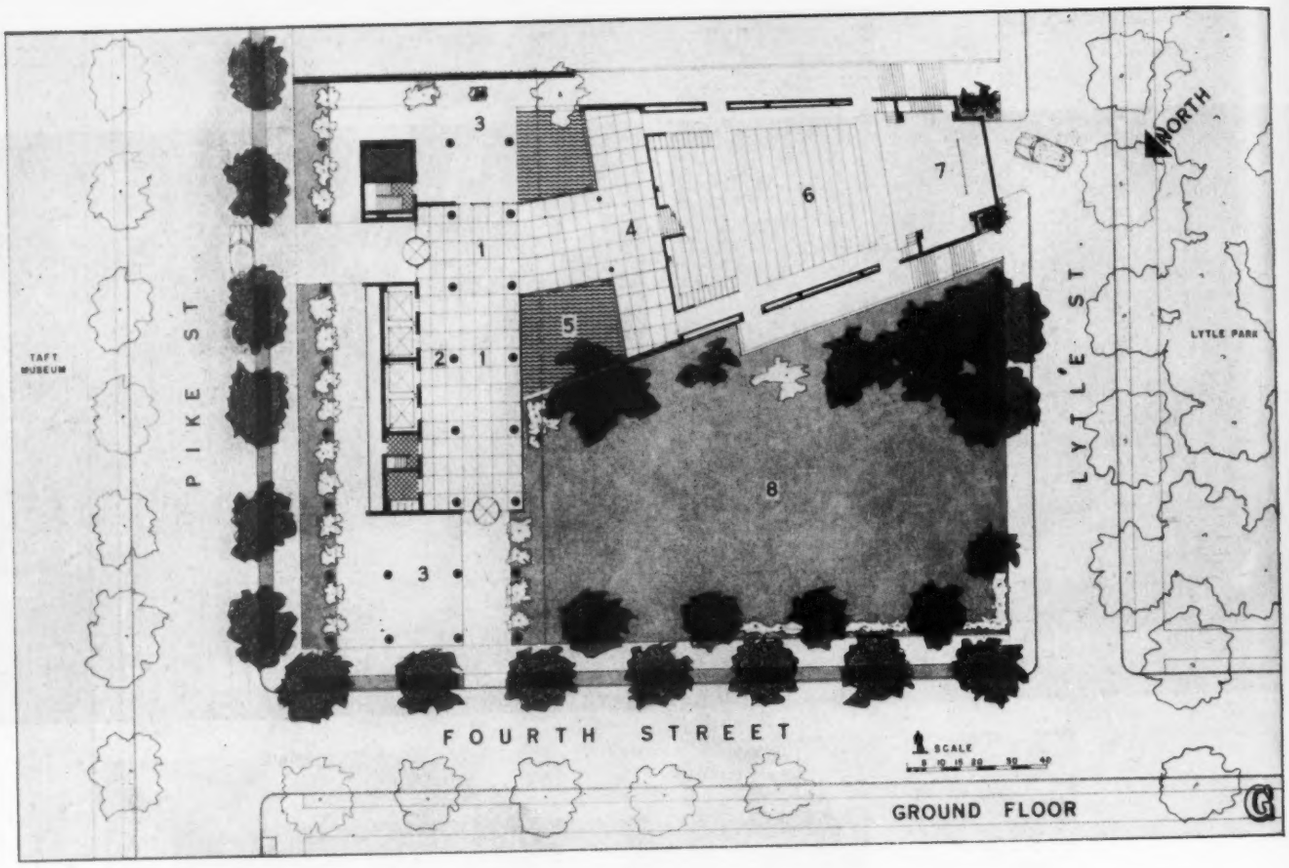
Needs and Circumstances

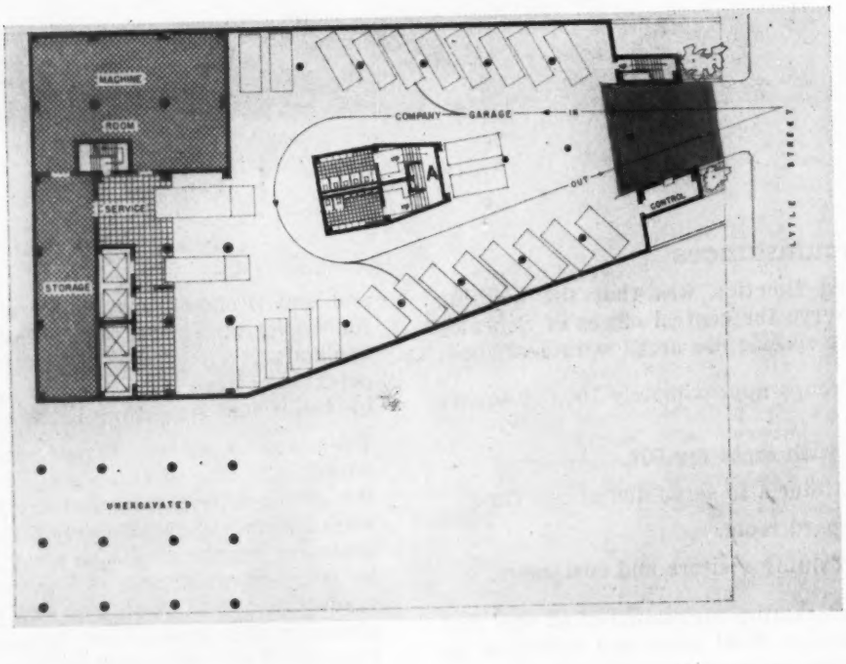
The primary stated function was that the building should house and serve the central offices of Schenley Distillers, Inc. Five specific use areas were described:

1. Office space to occupy approximately 100,000 square feet.
2. An auditorium with seats for 600.
3. An employes' cafeteria to serve 400 at one time.
4. A corporation board room.
5. A bar for entertaining visitors and customers.

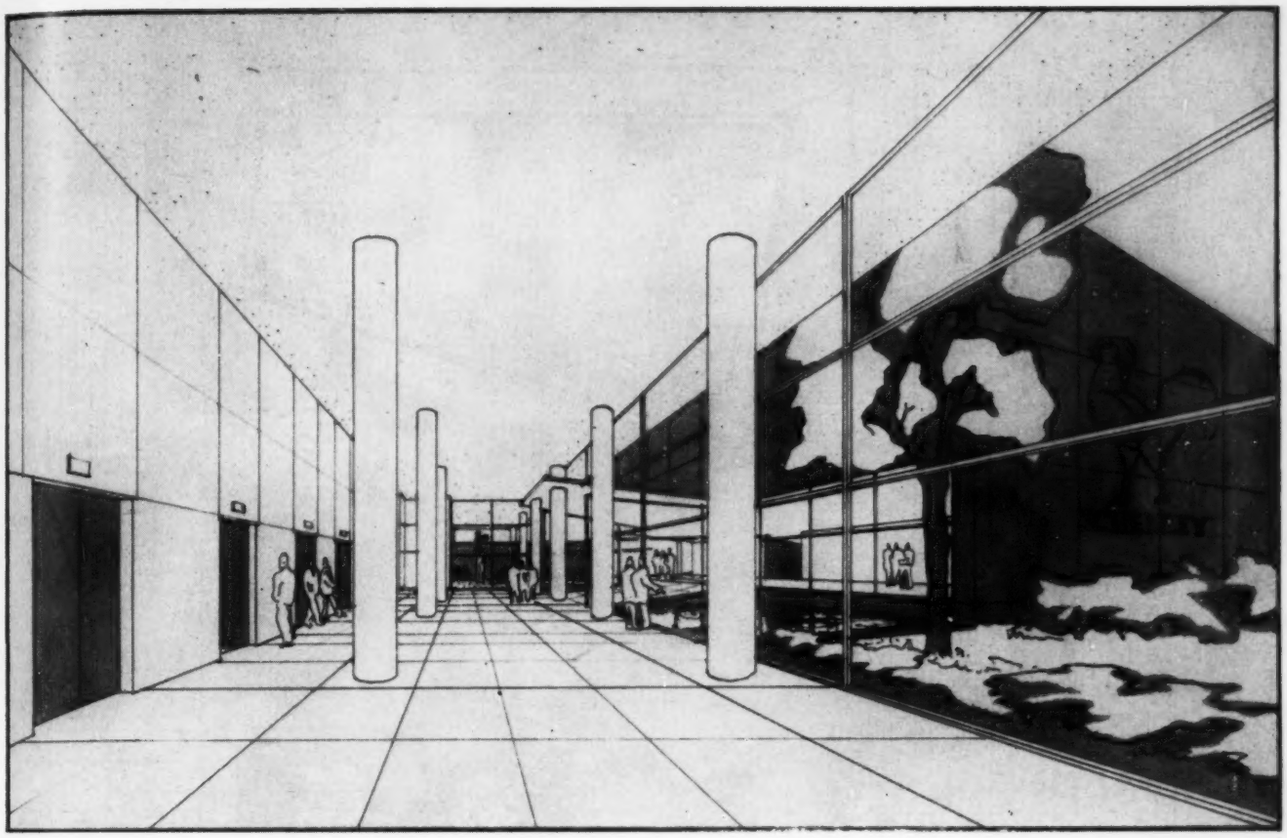
Perhaps the most interesting suggestion of all was that the building should be a focal point and reflect in its general character the progressiveness of the company and that it should provide more than usual amenities for employes. This is the kind of a program which we applaud; for no designer or architect, however competent, can hope to do his best unless the client shares his belief that something better is possible.

The proposed scheme started with yet another distinct advantage. One of the chief difficulties that confront the good contemporary architectural designer is that, while he knows how to supply things that on any logical basis are improvements on what has appeared to date, he is more often than not thwarted by the cramped inadequacy of the building lots provided by the non-planners and land abuse interests among us. The Cincinnati site proposed for the building shown here is a rare exception.


NORTH
PIKE ST.
LYTLE ST.
LYTLE PARK
TAFT MUSEUM
FOURTH STREET
SCALE
GROUND FLOOR
1
2
3
4
5
6
7
8


MACHINE ROOM
SERVICE
STORAGE
COMPANY GARAGE
IN
OUT
CONTROL
LYTLE STREET
UNEXCAVATED

Basement



Lobby, looking toward passage to auditorium.

Site

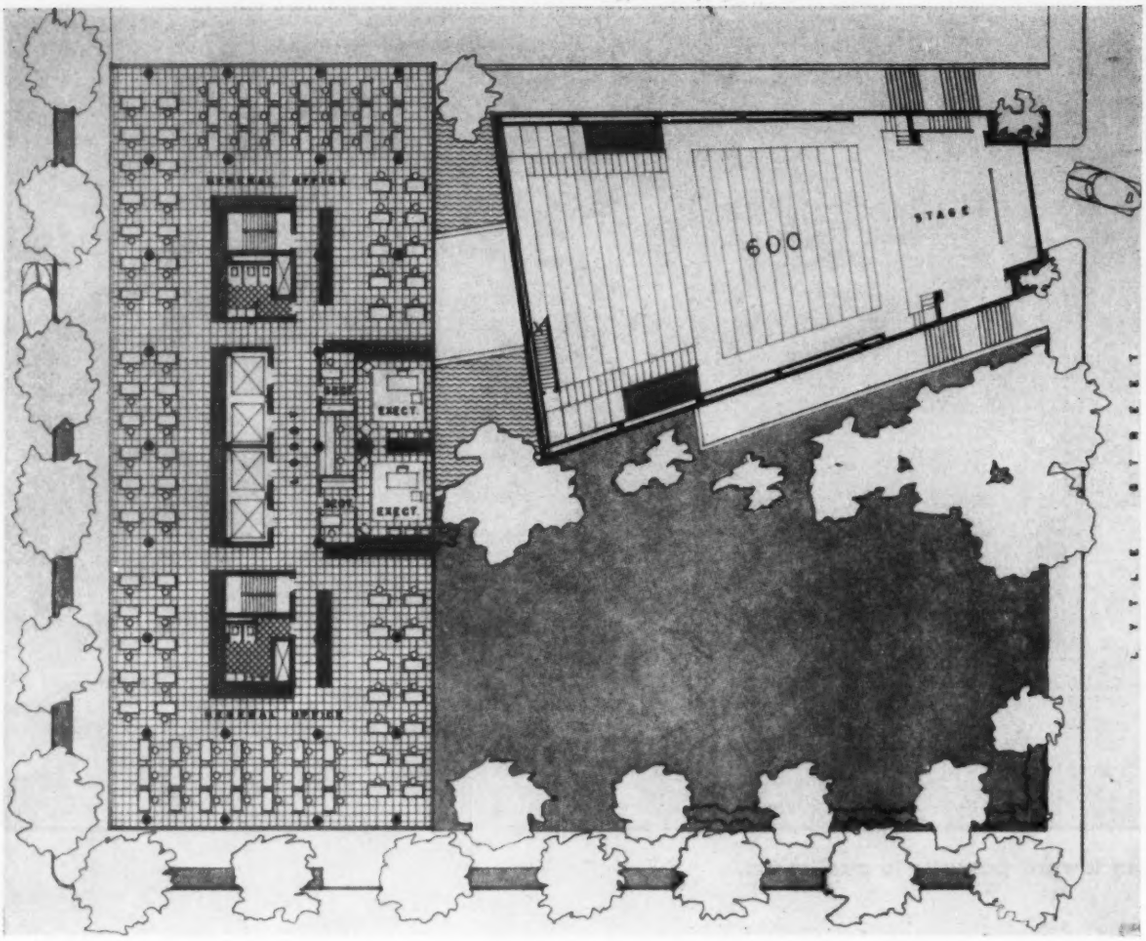
Located centrally at Fourth Street (see map) not far from where Columbia Parkway brings a large volume of traffic into downtown Cincinnati, it is not only flanked by a well-treed small park on one side and the lush grounds of the Taft Museum on the other, but it is itself a most unusual block to find in a downtown section. Only two residences now exist on the site, and the rest is lawn and trees. In evolving his site plan, the designer has sensed the extraordinary advantages of this circumstance and, except for the demolition of the existing buildings and the felling of two trees, he has retained intact the pleasant park-like character of the site. Not only this: in the scheme for the site development, planting around the building and the inclusion of small reflecting pools are proposed that would actually enhance the already exceptional property.

Building Plan

To preserve as much as possible of the natural beauty while providing proper functioning of the building, Mr. Garber oriented the major portion (the multi-story block) of the structure across the shorter dimension of the 160 by 200-foot site. Thus, offices have an uninterrupted view across the adjoining museum property and park. Further respecting the amenity of the existing planting, the ground floor of the office portion of the building is 22 feet in height, largely sheathed in glass, so that the present visual continuity between green areas is preserved from every viewpoint. Another and different sort of economical consideration was the limitation of excavation largely to the area at present occupied by the two residences.

The auditorium wing, schemed so that it could readily be used for outside functions (as well as for company affairs), is planned as a separate structure, although it is integrally connected with the main building lobby by a glazed covered passage between two reflecting pools. Under the auditorium area is a parking garage for executives' cars and off-street access for service and delivery trucks leading to a dock adjoining the elevators. A near-by lot provides car parking for most employes.

The typical floor plan is laid out to gain maximum daylight and flexibility of arrangement; the mechanical and circulation core is surrounded on all sides by 25 feet of clear floor space, which is enclosed on the outside by walls of glass extending from floor to ceiling. This space (as with practically everything in the building design) is laid out on a 40-inch modular basis. This dimension was chosen because it corresponds exactly with a system of standard, prefabricated partitioning which is now available. Throughout—in planning, construction, equipment, and control systems—every opportunity has been taken of the advantages and economies (less construction time, lower unit cost, greater ease of maintenance, repair, or replacement) to be gained through use of standard dimensioning and repetitive use of standard elements.



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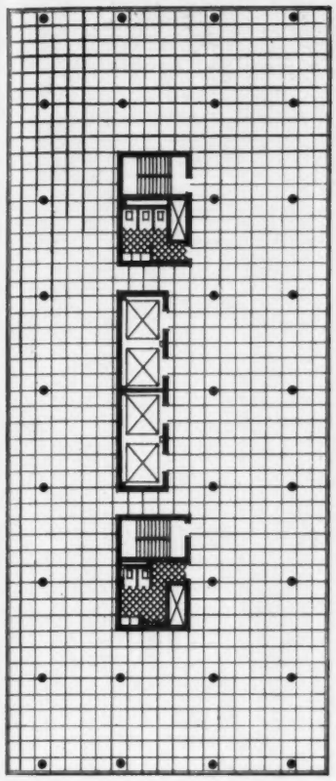
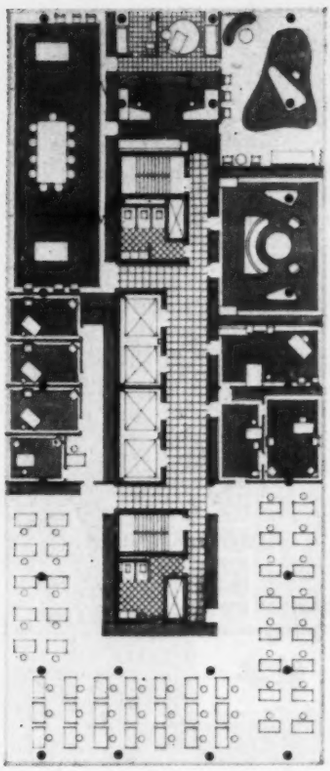
Structural System

The supporting structure is of reinforced concrete columns and floor slabs arranged in multiples of the basic 40-inch module. The glass divisions of the outside wall (standard throughout with the exception of portions of the two top floors) are 3 modules (10 feet) on center, and the structural columns of the building are 6 modules (20 feet) on center in both directions. The columns run from the roof to the footings without offset.

An immediate question is whether the system of all-glass walls may not be excessive—hard to heat, too bright, etc. The designer adopted this system only after considerable research and experimentation with a glass-manufacturing company. To start with, the glass panels are of double-layer, insulating glass consisting of two plates of ¼-in. heat-absorbing glass separated by ½ inch of air space. Use of the heat-absorbing type of glass accomplishes several desirable results which make the system practicable, according to the designer. It combines the insulative qualities of regular double-layer glass and the re-radiating qualities of the heat-absorbing type. By using the latter on *both* faces, heat is not only re-radiated from outside walls in summer, but panel heat inside the building in winter is re-radiated inward. Another advantageous quality of this type of glazing of which the designer has taken advantage is its pale green color deriving from a high metal content. This quality very materially reduces glare, acting in much the same manner as a pair of sun glasses. In an actual experiment in the

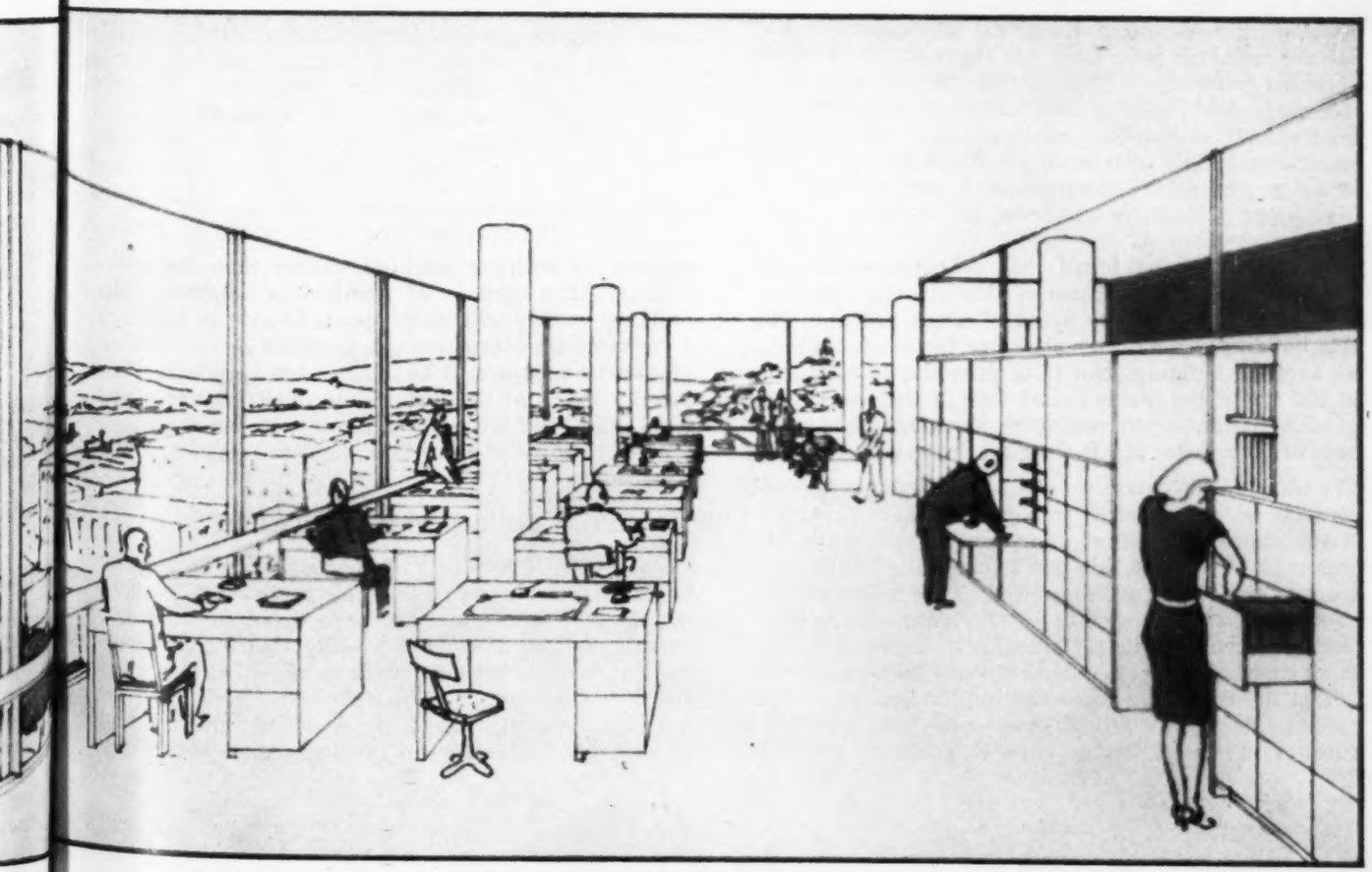


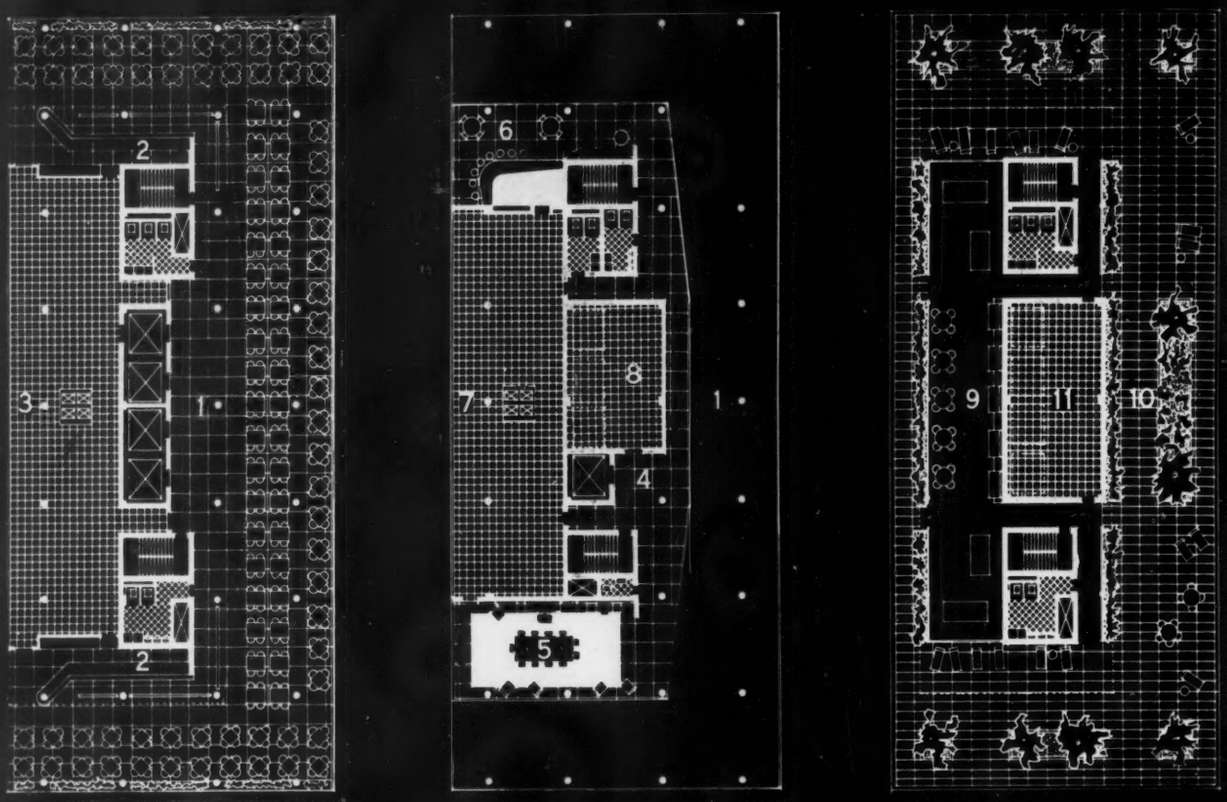
Typical Floor



Typical Floor, Subdivided

Typical office space, with floor-to-ceiling window walls.



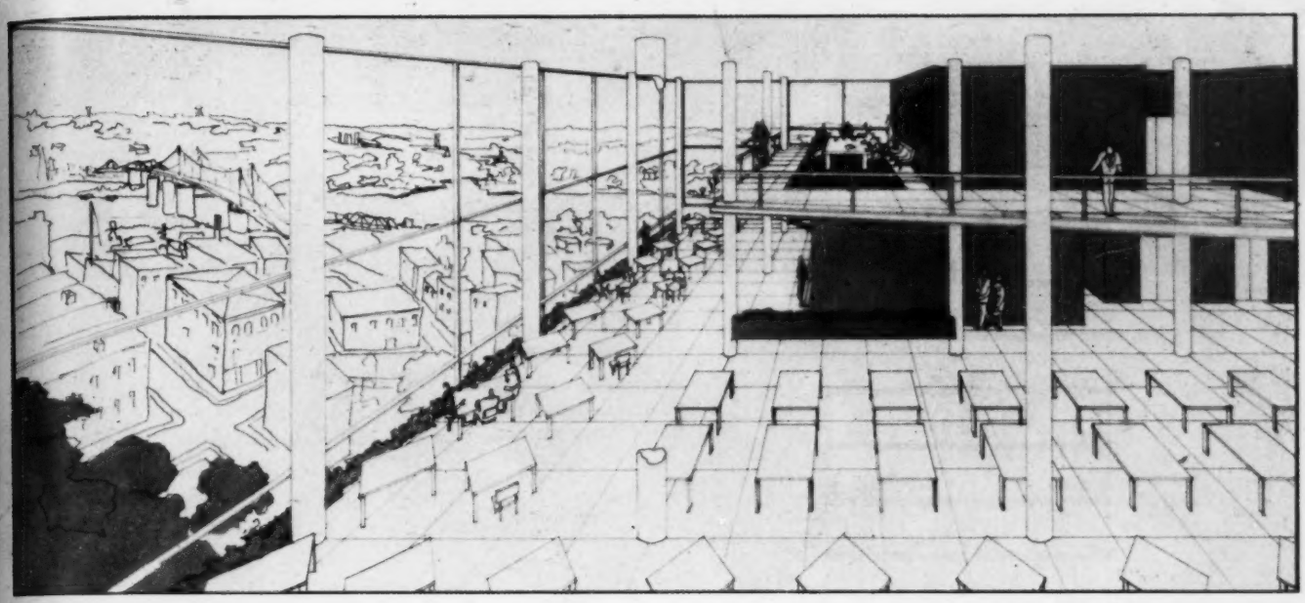


designer's office, he found that he could work with comfort beside a wall panel of this glass in full sunlight. Due to the large areas of glass proposed for this building, actual intensities are far above those in an average building, and it is proposed to sandblast at the top of the inside sealed face of the outer plate of glass to diffuse any remaining sky glare. The lower area of both plates is left clear for free vision.

For washing the outside of these glass walls, a remote-control car, suspended from a roof track, is proposed. A surprising fact turned up in construction estimates was that the use of this car reduced the installation costs of the glass (avoiding need of toe holds, attachment clips, etc.) enough to pay for twice the costs of the equipment. To keep the building bright and clean at all times, the thin, insulated closure strips that occur where the floor lines meet the wall and all incidental external finish are also of glass—polished, red structural glass in these cases. Thus, exterior washing will actually be building washing, rather than the interminable little corners of numberless windows. The building washer will, so to speak, be able to splash at a veritable ten-league canvas (whether or not brushes of comet's hair are to be used is not specified). The interior finish of the lobby is of yellow-blasted structural glass, and all kinds of glass proposed are standardized to one size each throughout the main building.

Heating, Cooling, and Ventilation

Because of the flexibility of floor layout, with the idea in mind that through the years there might well be numerous changes in room arrangements desired, a heating system of equal flexibility was worked out—radiant heating panels poured as an integral part of the floor construction. Since the slabs throughout the building are standardized, the designer found out that it was practicable for all heating panels to be shop



Cafeteria, with executive mezzanine over.

fabricated as standard units, welded to the steel reinforcing (to be used in the floor slabs) and brought to the site under test pressure ready to be installed on the forms—a structural synthesis which produced sizable cost savings. Heating feed lines are located in trenches and will be connected to the heating-coil panels after the concrete is poured.

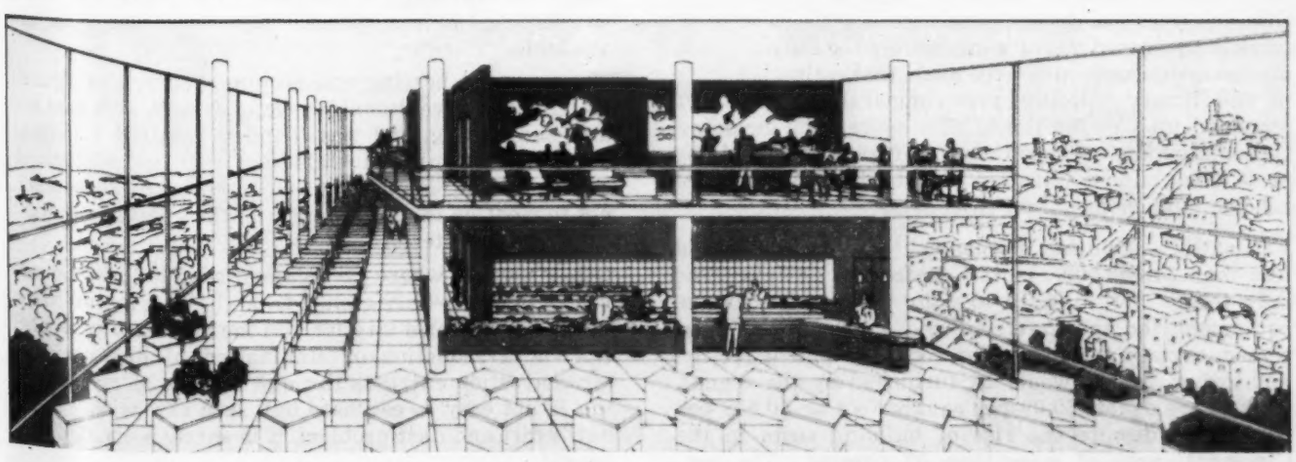
In the entire building, the only openings between indoors and out are at the ground floor and on the roof garden. There is not a single opening window; thus all air will be purified, dust filtered, and humidity controlled throughout the building and circulated through high-velocity ducts of small size. Not the least advantage gained by this is the relative simplicity of inside maintenance, cleaning, etc.

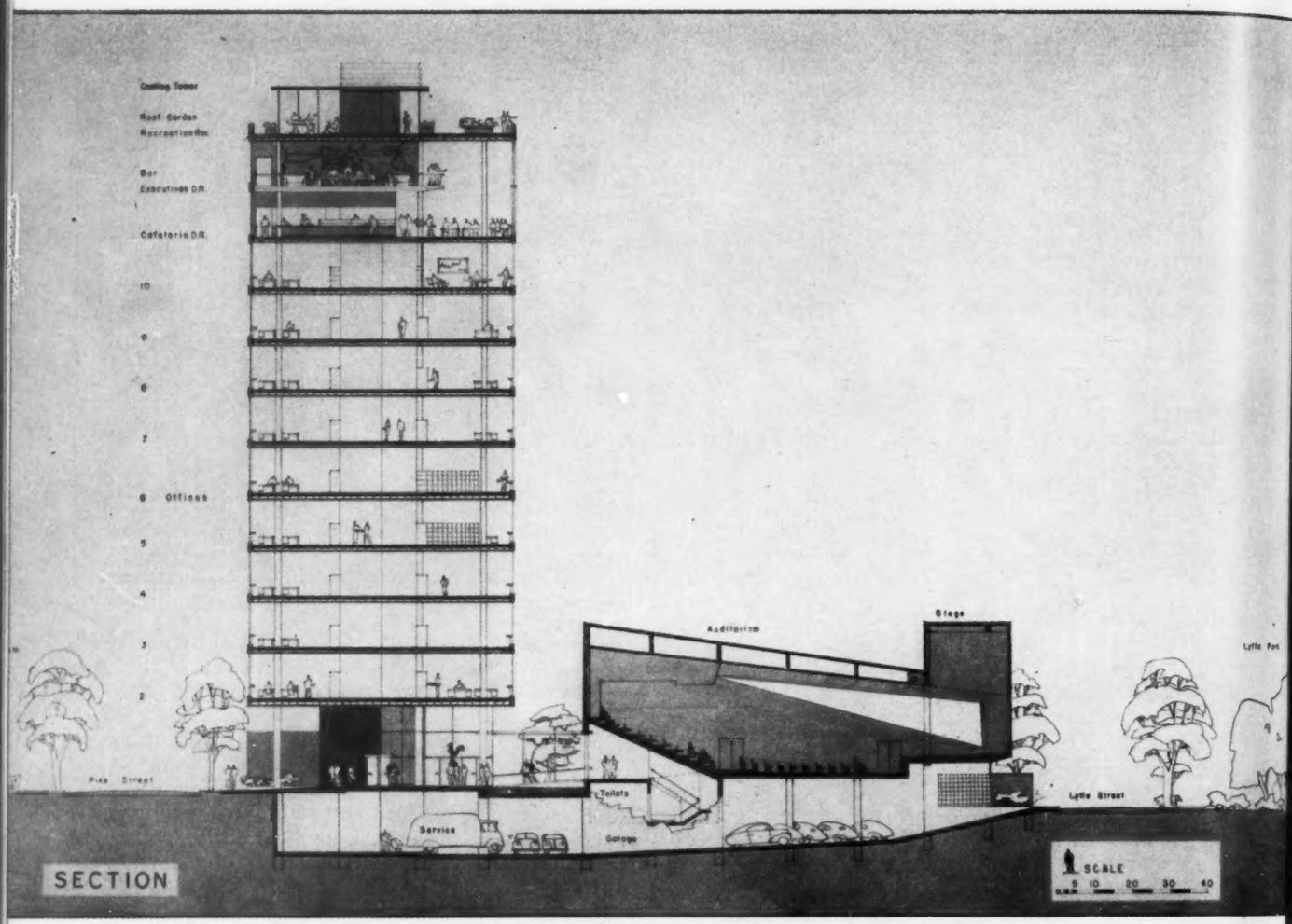
Summer cooling will be provided by circulating cold water in the floor panels, with the possibility of eliminating condensation through use of air-humidity control. Thus, the idea is that body heat of occupants will be removed by radiation to the cool floor, completely reversing the winter heating cycle. The auditorium and garage are heated and cooled by individual, conventional air-circulating systems.

Sound Control and Light

The interior of the building is protected from outside noise chiefly through the insulating exterior double-layer glass panels; inside noise is absorbed through the perforated acoustical ceiling tile, which are sized in increments of the partition module size. The ceiling light units are for flush installation and dimensioned so that they are interchangeable with the acoustic ceiling surface at any point that artificial lighting may be required.

A bar occupies one end of the mezzanine.





Costs

Construction costs on this building were figured by a local contractor in August, 1944. Figures were, naturally, based on costs at that time. It is most significant that, in structural design, consistent repetition of form work, coordinated use of a minimum of standard units, etc., so many economies were made that estimated costs of this luxury building were comparable to those of standard, un-air-conditioned office space, even including the auditorium, cafeteria, and roof garden. If this be so, it is not blind admiration to state that this proposed scheme is phenomenal on all counts.

Estimates, including mechanical equipment, totaled less than $1,500,000. In this figure are all fees. The only things not included are the interior partitions, equipment for the cafeteria and kitchen, the seats, screen, curtain and projection room equipment for the auditorium, which would be furnished by the tenant. This figure equals $9.09 per square foot or $0.599 per cubic foot, despite the rise of building costs in the Cincinnati area of more than 37 percent. The contractor also found that the same principles that make for structural economy also make possible speedy construction, and that (if necessary), this building could be completed in less than 120 days—once materials are available.

The proposed heating and cooling system was figured against the conventional convector system with summer air conditioning, and was found to cost but 1 percent more for the initial installation, with a maintenance and operation saving that amounted up to 30 percent, not to mention the area saved and the greater resultant flexibility of interior layout.

Other matters where savings and advantages—conservative elements—are gained from the easy maintenance of the clean, sealed interior and the increased personnel efficiency; reduction or elimination of dust-carrying air convection currents through the use of panel heating is not easy to estimate but, in a city with Cincinnati's dirt and dust problem, it is surely a considerable benefit.

Total Facilities

General
- Central location
- Garden setting
- Visibility of building

Basement
- All service
- Garage — 24 cars
- Machine room
- Storage
- Auditorium rest rooms

Ground Floor
- Office building
- Entrances — 3 streets
- Lobby — 2,600 sq. ft.

Auditorium
- Lobby — 1,700 sq. ft.
- Seating — 600 people
- Stage — 1,200 sq. ft.
- Projection booth

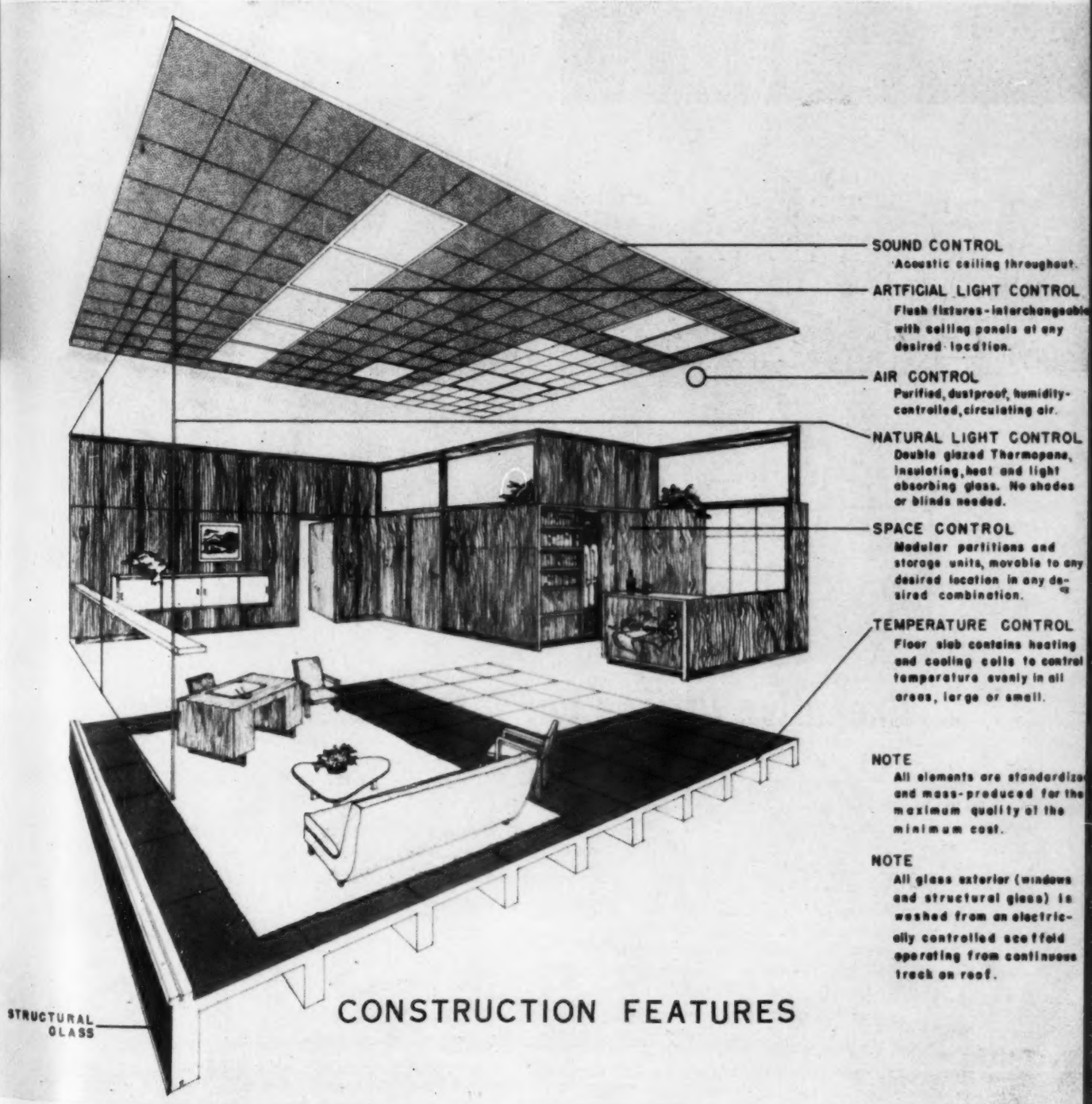
Garden
- Open — 12,320 sq. ft.
- Covered terraces — 6,200 sq. ft.
- Reflecting pool

Typical Office Floors
- (9 Floors) Area each — 11,200 sq. ft.
- Total office area — 100,800 sq. ft.
- Office Space
- Toilets (2)
- Stairs (2)
- Elevators (4)

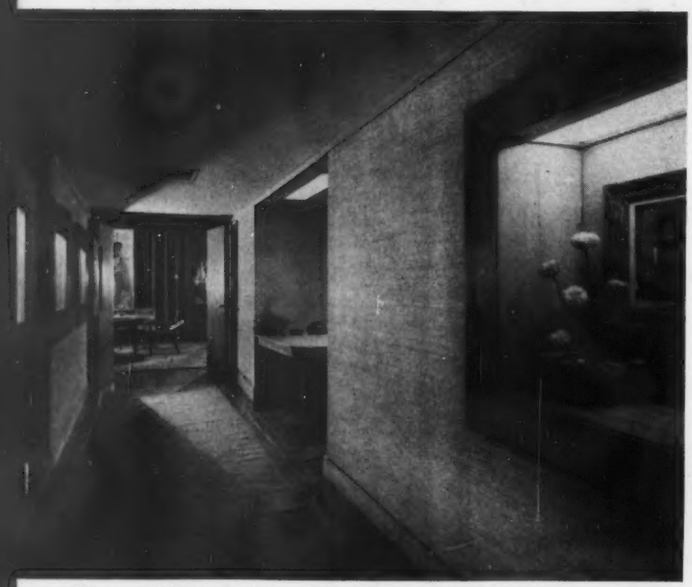
Dining Room Floor
- Cafeteria counters (2)
- Dining room (ceiling height—24′) — 7,200 sq. ft.
- Kitchen — 2,400 sq. ft.
- Toilets (2)

Dining Room Mezzanine
- Observation Gallery
- Executive dining room — 760 sq. ft.
- Guest bar — 640 sq. ft.
- Food preparation and storage — 1,968 sq. ft.
- Toilets (3)
- Elevator machine rooms

Roof
- Recreation room — 1,600 sq. ft.
- Covered terrace — 820 sq. ft.
- Roof garden — 8,400 sq. ft.
- Toilets (2)
- Elevator sheaves

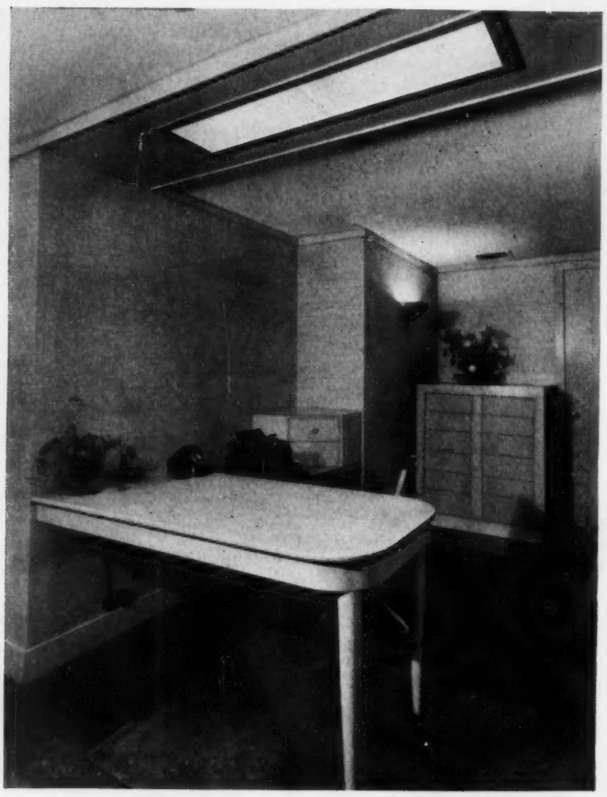

SOUND CONTROL
Acoustic ceiling throughout.
ARTFICIAL LIGHT CONTROL
Flush fixtures - interchangeable with ceiling panels at any desired location.
AIR CONTROL
Purified, dustproof, humidity-controlled, circulating air.
NATURAL LIGHT CONTROL
Double glazed Thermopane, insulating, heat and light absorbing glass. No shades or blinds needed.
SPACE CONTROL
Modular partitions and storage units, movable to any desired location in any desired combination.
TEMPERATURE CONTROL
Floor slab contains heating and cooling coils to control temperature evenly in all areas, large or small.
NOTE
All elements are standardized and mass-produced for the maximum quality at the minimum cost.
NOTE
All glass exterior (windows and structural glass) is washed from an electrically controlled scaffold operating from continuous track on roof.
STRUCTURAL GLASS
CONSTRUCTION FEATURES

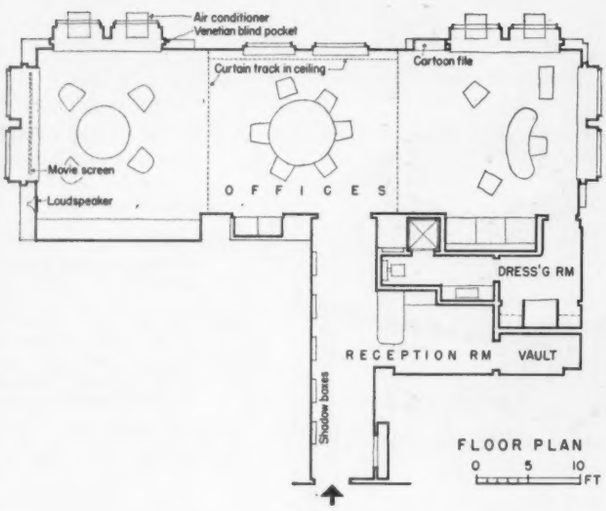
Structural elements—standardized from unit dimensioning all the way down to equipment and furnishing.



Chicago Architectural Photographing Com.

Entrance passageway. Shadow boxes at left display magazine covers. Secretarial space (right); as with the entrance, walls are natural grass cloth with birch trim. Specially designed file cabinets, table, and chair are of natural birch.



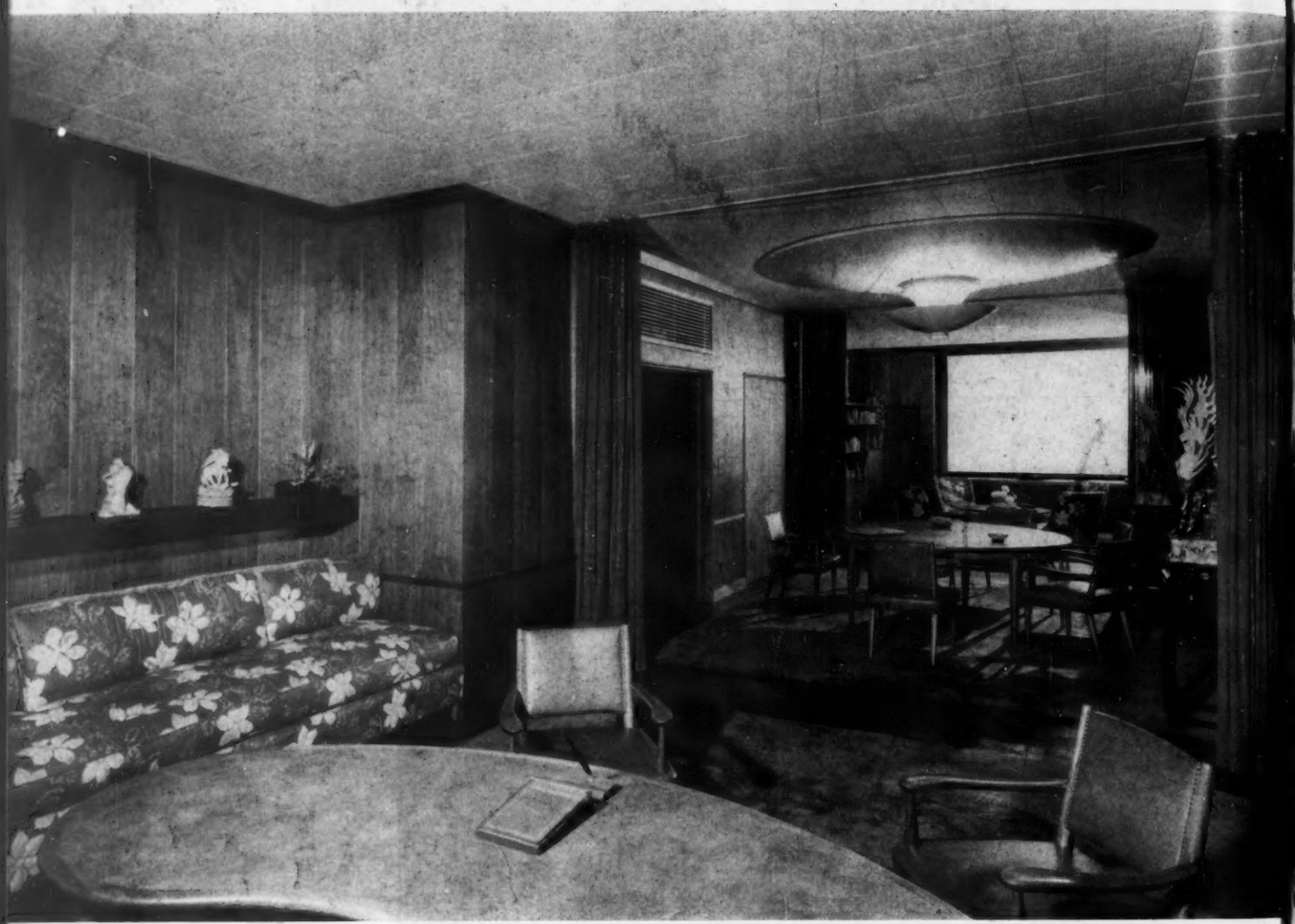


Executive Offices For A Publisher, Chicago

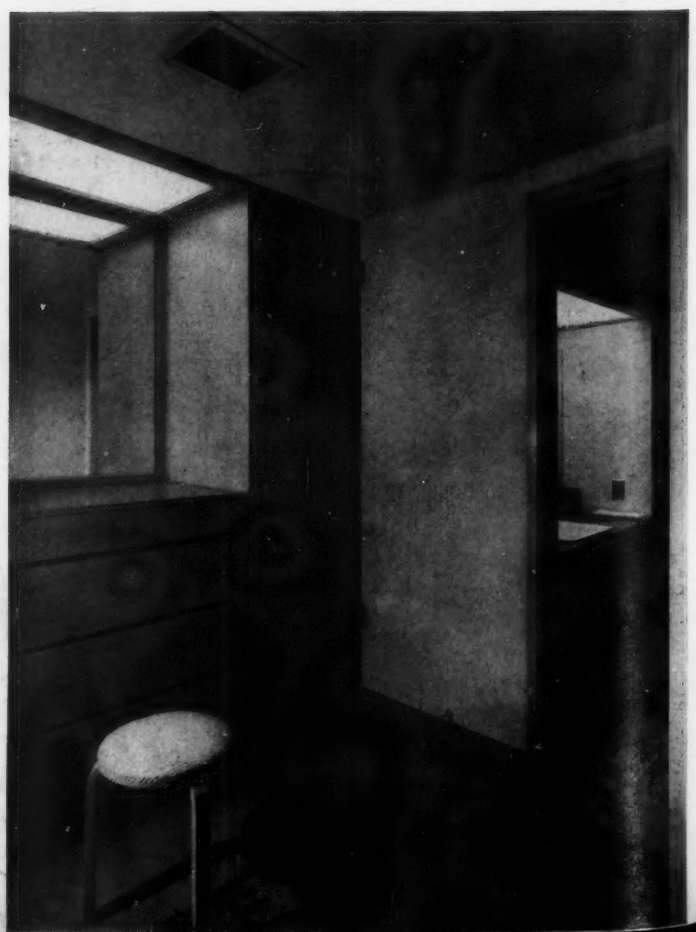
McSTAY JACKSON CO., DESIGNERS

The executive offices of a publishing house frequently demand certain qualities that distinguish them from other types of offices. In many cases, those who come to discuss business are authors or artists—specialized types of highly intelligent persons with whom the organization may expect to work out collaborative arrangements that will redound to their mutual benefit. Hence, it is important, or at least salutary, to provide an environment that is rather more prepossessing than might be required of a routine business office where the impression on the visitor is of comparatively little importance. In the office suite shown on these pages, contrived within rental space in the Palmolive Building, a highly individual character has been developed, creating an atmosphere that appears to fall somewhere between that of a business office and rooms in a private home. The designers are responsible for all of the furniture as well as for the architectural treatment and incidental decoration.

The executive office above is equipped with a built-in sofa-bed. A light trough conceals the light source above the sofa. Conference-lounge space (below). Walls are paneled in walnut. In the lounge end of the suite, the specially designed chairs are upholstered in brown, green, and beige quilted linen. Built-in features include a radio-phonograph, space for recordings, bookshelves, and a small bar.



Conference area, which may be separated by curtains. Rug, bright green chenille; curtains, green textured, shot through with copper threads; furniture, brown mahogany with brown leather upholstery; acoustical ceiling. The light dome gives both direct and indirect lighting. Right: dressing room and bath; built-in cabinets and wardrobe, natural birch.

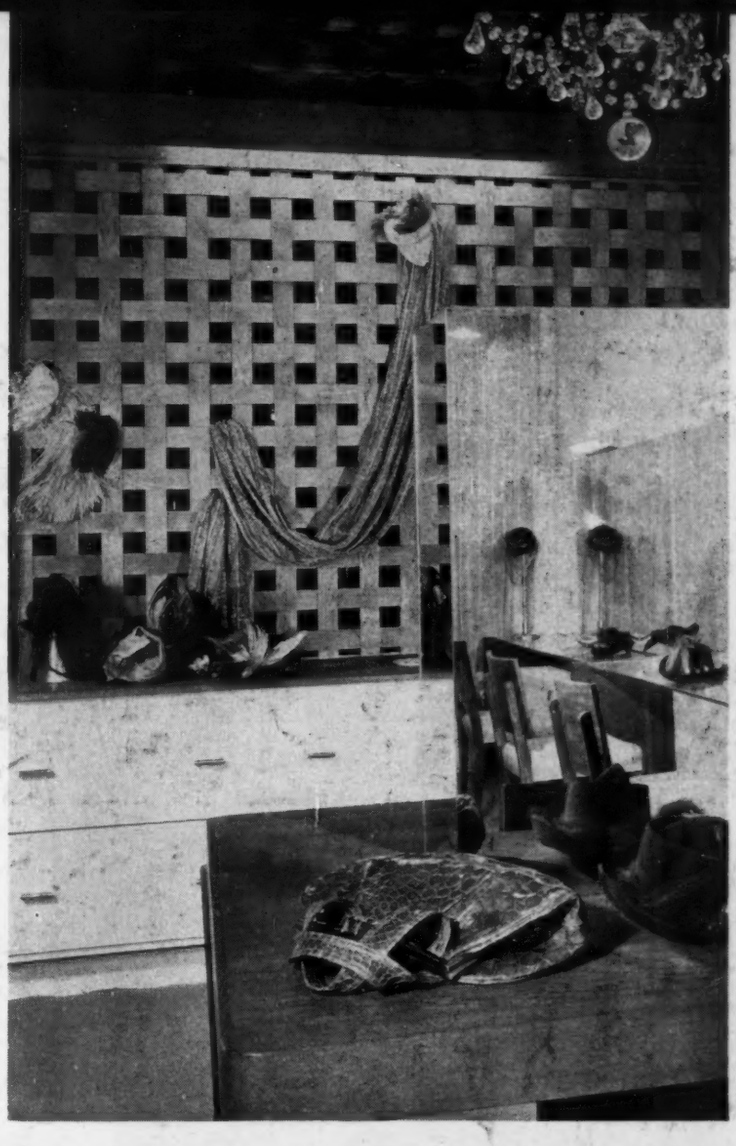


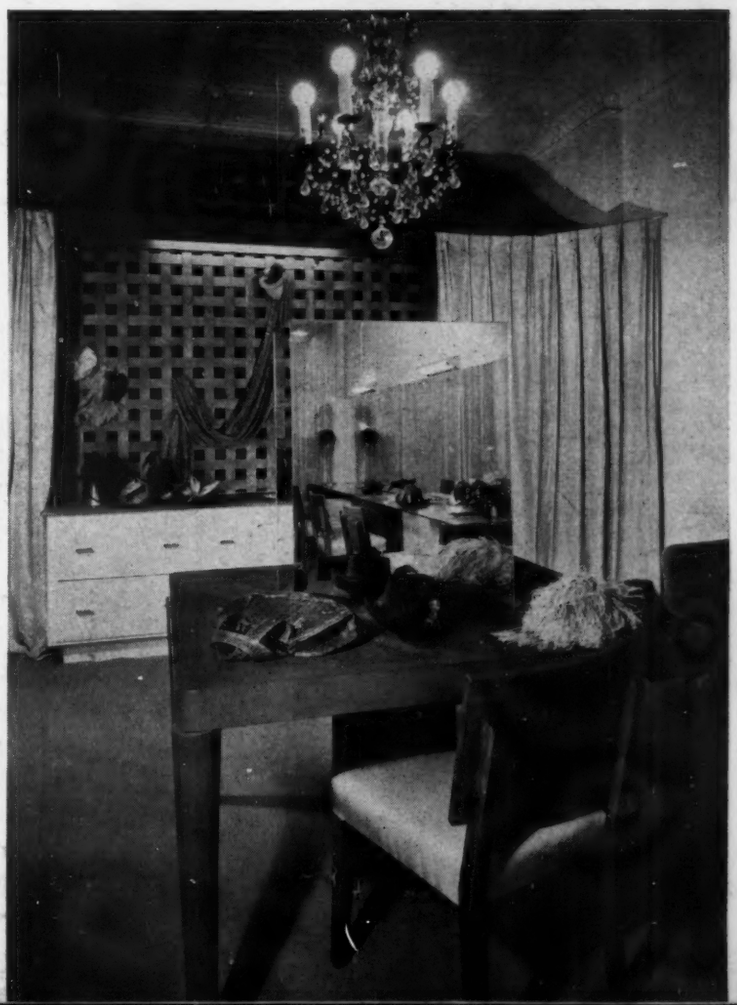
In this small remodeling job, located in a two-story block of stores with apartments above, the only structural change was in the shop front; otherwise, everything is just as it was (including the tin ceiling), and the new character was developed entirely from new carpeting, furniture, draperies, fresh coats of paint, and a modest amount of new lighting.

In addition to demonstrating what may be accomplished at minimum cost, it also shows how far a little creative effort can go toward providing an attractive, contemporary shop. By its utter simplicity, it stands head and shoulders above the average shop of this type. The large square window combines the functions of both the traditional and more modern theories of shop-front design. It serves as a display for merchandise, but since the back is omitted, it also functions like an open-front scheme to frame a view of the entire store.

The front is of waxed redwood siding, with wood trim and lettering painted flat white; the awning is rust color. Since hats in themselves are full of color, the idea within was to provide a simple neutral-toned background which would allow the millinery to speak for itself.

The walls are painted gray; the mercerized cotton curtaining and the furniture upholstery are also gray; the all-over carpet is a rust tone, chosen to harmonize with the waxed redwood of the furniture and casework. In the center of the rear sales space is a four-sided mirror table that accommodates four customers at once; along one wall near the front of the shop, a sales counter with mirrors is equipped with chairs for four more. Dividing the shop proper from the work room behind, is a case of drawers topped by an open lattice screen made of redwood veneer strips. This is used as a display background and permits a view of the shop from the work-room. The elaborate crystal chandelier is supplemented by new fluorescent fixtures.





PHOTOGRAPHY FOR THE ARCHITECT

By G. E. Kidder Smith, A.I.A., A.S.P.A.

Having a natural interest in photography and several unusual opportunities to develop it in the last half dozen years, I have picked up by much trial and considerable error some useful points of procedure. A professional would undoubtedly disagree with many of them, and of course all have exceptions, but in the main I believe them to be helpful. Almost all of them revolve about expressing a brilliant play of light and shade, for to me this is the essence of architectural photography (1, facing page).

Throughout the day the sun plays on our buildings, producing changing effects, emphasizing certain features we wish emphasized or vice versa, bringing out by quantity and angle of sun the three-dimensionality and rhythm of the design (2). Most of us forget this when we set forth to photograph even our own buildings, and snap with little consideration of what the light might be two hours earlier or later.

What then should be our approach; how had we best begin to photograph our buildings? Start with a bright, sunshiny day, preferably with a few harmless clouds thrown in to break up sky areas. Then, site plan and red pencil in hand, stroll leisurely around the entire project, forward and backward, noting the angle of the sun and estimating at what time it will be best on the sides or sections you wish to photograph. This can be done almost any time of day and forces you to imagine light conditions at other times. I make small arrows on the plan with 9:00-10:00, noon-2:00, 4:30-5:00, etc., indicating where the sun is (or should be) good at these times. By a "good" sun is meant one—and this is immensely important—which is strong on *one* facade, generally the main one, and *not* on the adjoining one (3)—in other words, with the sun from the side or even slightly in front (4), but not directly behind. Select only the most expressive and revealing illumination; make the building play with light and shade; make the chiaroscuro sing (5). Composition must be "felt," but lighting can be analyzed, and there is no excuse for bad examples. Note when eaves cast interesting wall patterns, when trees project shadows in the early morning or late afternoon, when the foreground will be in shade and the main subject highlighted (8), when a hole in passing clouds spotlights the subject (7), when contrasts sparkle. (Incidentally, this consideration of the amount of sun on various facades never did any architect harm.)

Having chosen the lighting, we must interpret the atmosphere and character of the subject. Beware, however, of snapping without thinking. We often have what might

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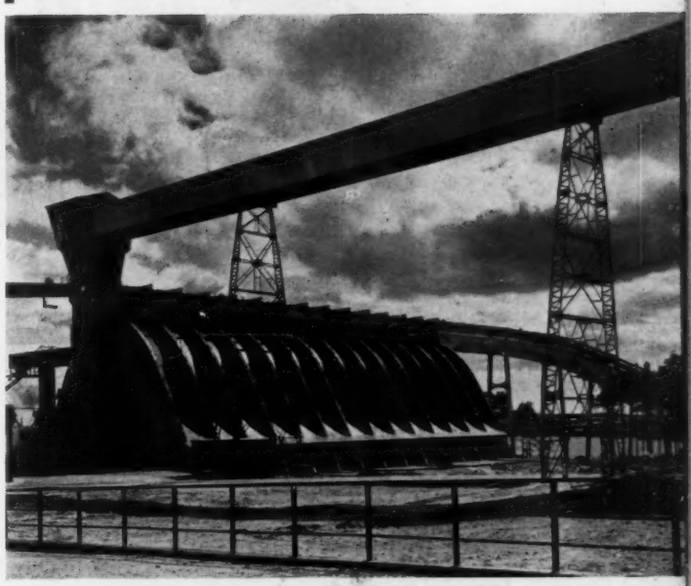

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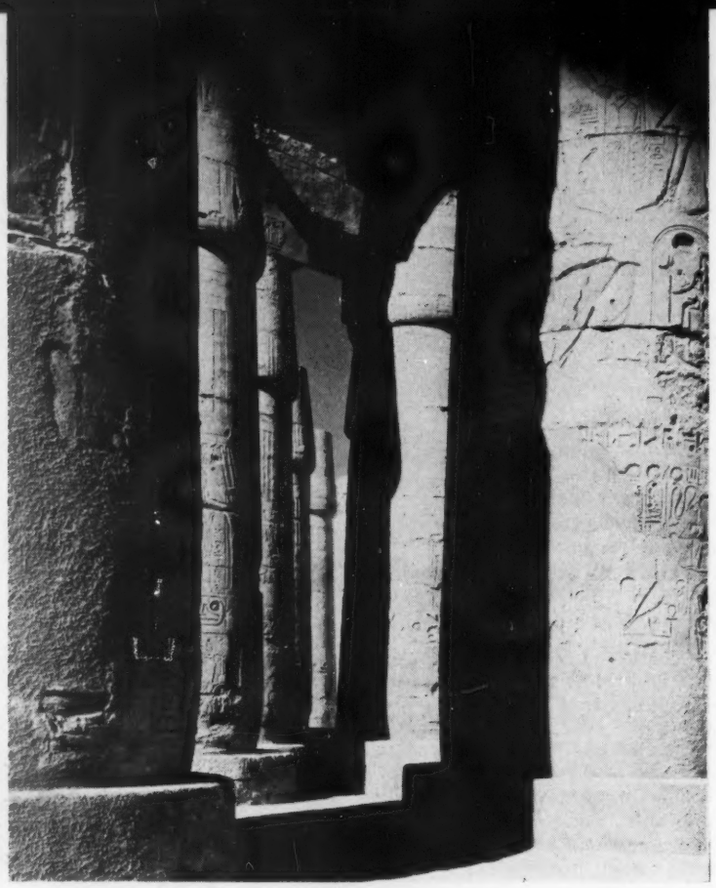
1. (facing page) The Theseum, Athens—"a brilliant play of light and shade." 2. Sunila Pulp Mill, Finland. Alvar Aalto, Architect—"the sun . . . emphasizing certain features." 3. Elementary School, Stockholm. Paul Hedquist, Architect—"sun strong on one facade." 4. The Parthenon and Erechtheum—"sun from the side . . . but not directly behind."



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be called "preposition trouble" in that we seek only a picture *of* the building instead of one *in* the building. If we *concentrate more on getting a good picture*, than on the amount of subject shown (6), we will in most cases get what we want in the building; but if our conscious end is directed only toward a picture of the building and the camera is used merely to record that end, we will get no more than this record.

We will first want to show the subject as a whole, and the initial reaction is simply to move back far enough so that the lens subtends the structure from end to end. However, this will seldom produce a complete impression, for we have included only the building and little of what goes on around it. It is therefore generally wise to get off far enough to relate building and landscape, and tie it to surrounding trees, rocks, water, or other buildings (7, 9, 10). If the building hangs over a lake, by all means include it; if near a forest, go in and shoot out (often better than with the woods merely as a background); if hemmed in by city buildings, try the roof across the street. But whatever is done, do not walk up and thoughtlessly shoot from the hip.

Having taken the subject from a distance as an entity related to setting, let us approach for more specific views, revolving about the subject as we draw near, to obtain a series of photos that is complete from over-all to detail. (11) is an example, being a detail of the church in (7). Seek, then, the character-giving parts which tell the story, the important points, the features. Eliminate the superfluous which obscures the structure. As an example, note the photograph of the school with the prominent outside stair (12). This is obviously the feature of the entire building, yet if the camera had been placed to include the whole school, the stairway would have been lost.

Even after we have found the best light and the part we wish to accent most, we must still arrive at a composition. This is obviously of the essence, and one could argue about it for a hundred and three years, but it is the architect's strong point—or at least one with which he has nodding acquaintance. Many ingredients are needed: a dominant (usually), a certain equilibrium (*very* rarely symmetry), variety of line, mass, light and shade, rhythm, and other abstruse elements which one can read about in the savants' notebooks. I try to sidetrack all divine triangles and optical metaphysics by the simple device of squinting. Squinting gives contrasts similar to that on the final print and helps flatten the three dimensions of the scene into the two of the photograph.

Although the "framing school" with vistas through pretty arches is trite, the device of holding down the foreground with parts of another building, trees, figures, etc., will often give depth, especially if the foreground value is darker than the background. Note, in the picture of the Old City in Stockholm (13), how the main subject matter is projected back in space by the foreground. In addition to giving depth, a strong foreground can be the basis of the whole composition (14). If this foreground can recall the main element architecturally, so much the better. An example of this is seen in (16), where the column bases are really details of the columns beyond.

If our subject matter is composed of a number of separate buildings, there will be many opportunities of projecting them in space by light and shade. Do not approach a group with the idea of getting only individual shots of each, but relate them to each other, tie them together, give an impression of spatial composition. It is not necessary to include whole sides of each to do this. As a matter of fact, more can often be said by a choice detail than any over-all panorama. In the two pictures shown in (15) and (16), taken on the Acropolis, an attempt was made to give *impressions* of the relations of the buildings—not catalog them archeologically with every column and cornice showing. Is this not more satisfactory than a sunless photograph showing every mortar joint of each block of marble? Relating two buildings as shown can be termed an extension of the point mentioned above with regard to having some element in the foreground to give depth; in these cases it fills a dual function.

The second of the two illustrations recalls another point which it is useful to bear in mind—camera height. I wanted in this case to give some feeling of the crowning quality of the Parthenon. If the camera had been at eye-level it would only partially have succeeded, but by placing it almost on the ground the whole building is made to seem on a pinnacle. Furthermore, by including a small section of the Propylæa in the foreground, with its rather rhythmic shadow, the composition was given depth and plasticity. (It was of course necessary to stop the lens down as far as it would go to give sufficient depth of focus, and also to make use of the swing front.) Note that the picture was

delayed until the sun just picked out the edges of the columns at left, giving life to the shadow side. As (17) will show, a high camera position is sometimes more expressive than a low one.

The use of scale figures as commonly done on drawings can be carried over into photography as well. In architectural sketches we make them part of the composition or include them unobtrusively for reference only. In photography we can do likewise; however, avoid at all costs backing some unfortunate up against the wall, whence he self-consciously stares into the camera. Make the figure fit into the picture naturally; make it a considered part of the composition. Try placing a friend in the spot you think best, have him face *away from* the camera, and in the act of taking a step—not standing stiffly (18 and 19). Figures can be used in a number of ways; for reference only, to lead the eye into the picture, or as a strong point of the composition to hold down a whole side of the picture (18). To show how essential the figure is in this last shot, cover it up and note how the composition falls apart. In photograph (20), the figure was used to lead the eye into the picture. In this case there was no posing. I merely waited until someone came along, and used a fast enough shutter speed (1/50 of a second) to stop him.

Interiors are undoubtedly difficult. In addition to the obvious need for wide-angle lenses, a battery of lights seems necessary. The main idea, as I understand it, is to illuminate the room so that contrasts are weaker than you think they should be, with dark corners non-existent. At any rate, this is the safest way to start. However, I find that a surprising amount can be done with natural daylight, sometimes supplemented by fixtures in the room. The lovely Hedquist auditorium (21) was taken in the very early morning when the sun was streaming across the entire width. Beware of trying to contain, in naturally lit rooms, scenes through open windows and outside doors; either the interior will be under-exposed or the outside over—or both! Also, in taking interiors, move out some furniture, or the picture will make the room look more cluttered than it actually is.

Equipment and technical apparatus have been purposely left to the end, as their importance is always less than that of the man. The best camera in the world can take the poorest pictures, yet the expert can produce top-notch stuff with even a Brownie. Architectural photography does, however, make demands unknown to most other outdoor work. Good pictures can be made with almost any camera, but a moderately good one will let you take more and better ones—IF you know how to use it. In any case, get a simple machine first and graduate only when you find yourself limited. I believe the best kind for architects is the rectangular ground-glass back, folding variety,

7

5. Rameseum, Thebes—"make the chiaroscuro sing." 6. Temple of Karnak, Egypt—"amount *of subject secondary." 7. Ouro Preto, Brazil—"a hole in a cloud spotlights the subject." 8. Royal Palace, Stockholm (Early 18th century)—"foreground in shade . . . main subject highlighted."*

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9. Cotswold Farm, Gloucestershire—"relate building and landscape." 10. Cooperative Apartments, Stockholm.

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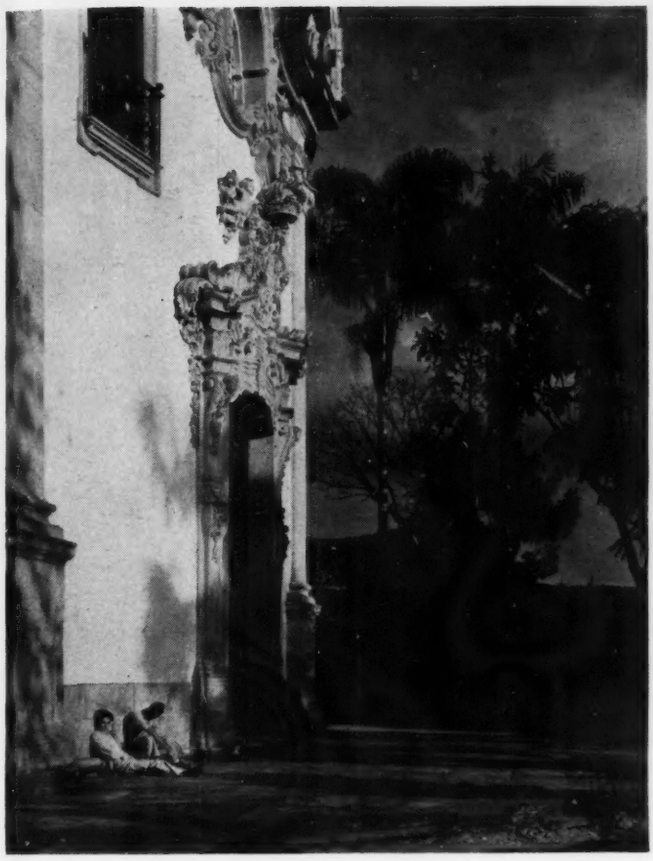

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12

11. Ouro Preto, Brazil—"approach for more specific views." 12. Industrial School, Stockholm. Paul Hedquist, Architect—"seek the character-giving parts."

equipped with rising and sliding front, and taking film packs. This is best used on a tripod, for several reasons. *One*—with the ground-glass back, one sees what the lens takes, *exactly and full size*, before it takes it. No matter how accurate the usual finder may be (and this includes those corrected for parallax), there is always a degree of uncertainty which the ground glass obviates. Nor will an optical finder give anywhere near the image size of the final print. By focusing and composing on ground glass, we are not only sure of the amount the lens subtends but of its focus as well. *Two*—the ground glass translates the three dimensions of the scene into only two. This is extremely important in any photography but especially so in architectural work where a difference of several feet might cause considerable change in the picture. It is obviously easier to determine a composition relative to two dimensions than to three. Ground-glass viewing, with its ease of composing and focusing, is the main reason for the great success of the twin-lens reflex cameras such as the Rolliflex, Ikoflex, Argoflex, etc. *Three*—the ground-glass, film-pack type of camera almost always has what is called a rising, falling, and sliding front, a feature almost no miniature and few roll-film cameras possess. This simply permits you to keep the camera back level and elevate the lens front relative to the back to include the subject from top to bottom as shown in (19). The distorted perspective which results from tilting a camera which does not have this feature is well known and is inevitable unless the back is parallel to the building. Many cameras of this type also have "swings"—which means that the lens front and back can be turned to various angles—a feature useful in more advanced work, in that it gives more freedom in focusing and composing.

There are other advantages in this kind of camera, such as interchangeability of lenses, etc., etc., but the ones mentioned are sufficient to justify its choice. Fortunately, such cameras are not overly expensive—not nearly as costly as some of the fancy miniatures—and several makes, both domestic and imported, can (or could) be had. The preferred sizes are 2¼" by 3¼", 3¼" by 4¼", or even 4" by 5". I think that either of the first two would be handier and cheaper than the latter, especially for the beginner. I feel that the 35 mm. camera is more or less a waste of time, especially for the architect. Others will disagree, but I find I use mine only for color.

After the camera, a tripod comes next in importance. The mention of "tripod" may make you think you are getting in for a lot of fuss and bother just for a few pictures, but if you want results you must expend the effort. You will soon find that a light metal folding support (although the bulkier wooden ones are sturdier) will become second nature. I carry thirty pounds now, fifteen on each shoulder, and don't give it a thought. The theory of the miniature—take a dozen shots, one is bound to be good—will never produce results equal to one thoughtful composition with a ground-glass camera on a tripod.

A medium yellow filter to give quality to the sky and bring out the clouds, an exposure meter to determine diaphragm opening, and a lens hood to keep the direct sun off the lens, more or less complete our outfit. It can eventually run into many lenses, a dozen filters, and countless other useful (or shiny) gadgets. It need not go beyond one lens, one or two filters, the meter, and a lens hood.

The best results undoubtedly come from enlarging your own negatives—*if* you have the desire, ability, and experience. But the "if" is a big one, and unless the itch is there, let some competent professional finishing service do the job for you (rarely the corner drug store). When you think you have something really first rate, have what is rather juicily called a "salon" print made. Costing two to three dollars, a "salon" print is no more than an enlargement very carefully made, with more thought and attention to paper, exposure, emphasis, etc., than is possible with run-of-the-mill work. A few of these will give your morale a great boost.

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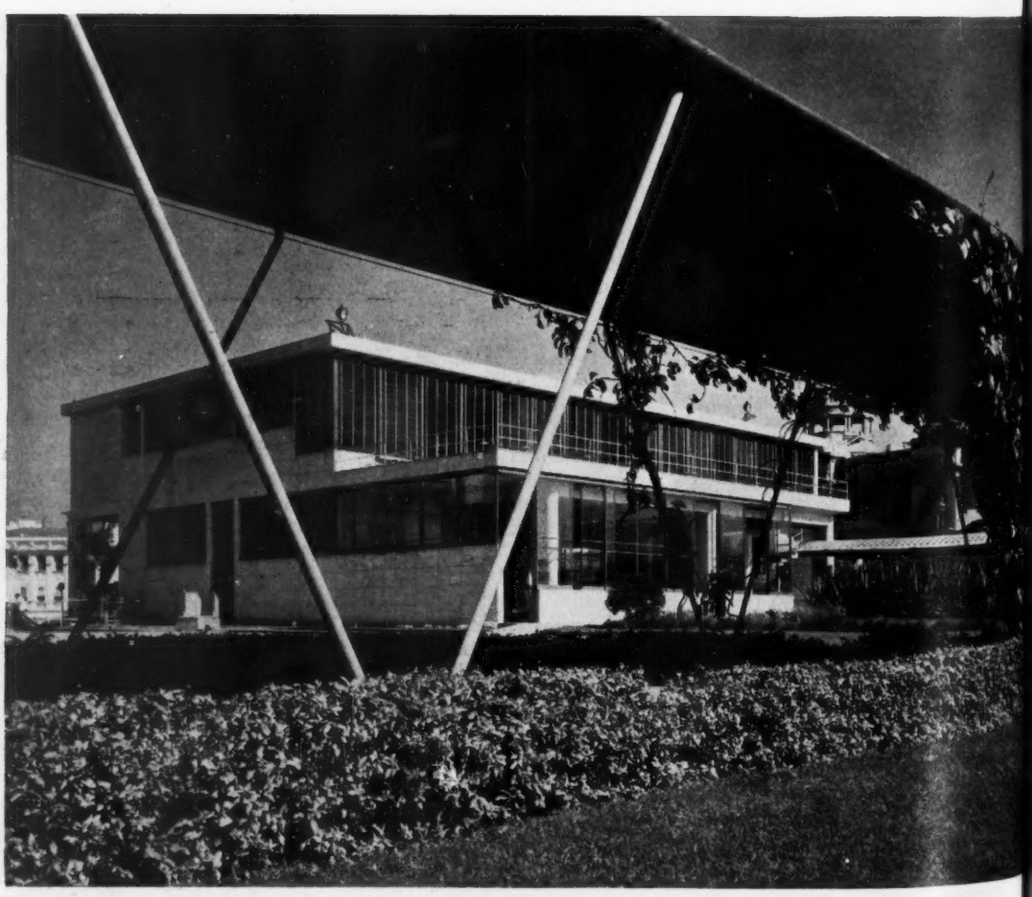

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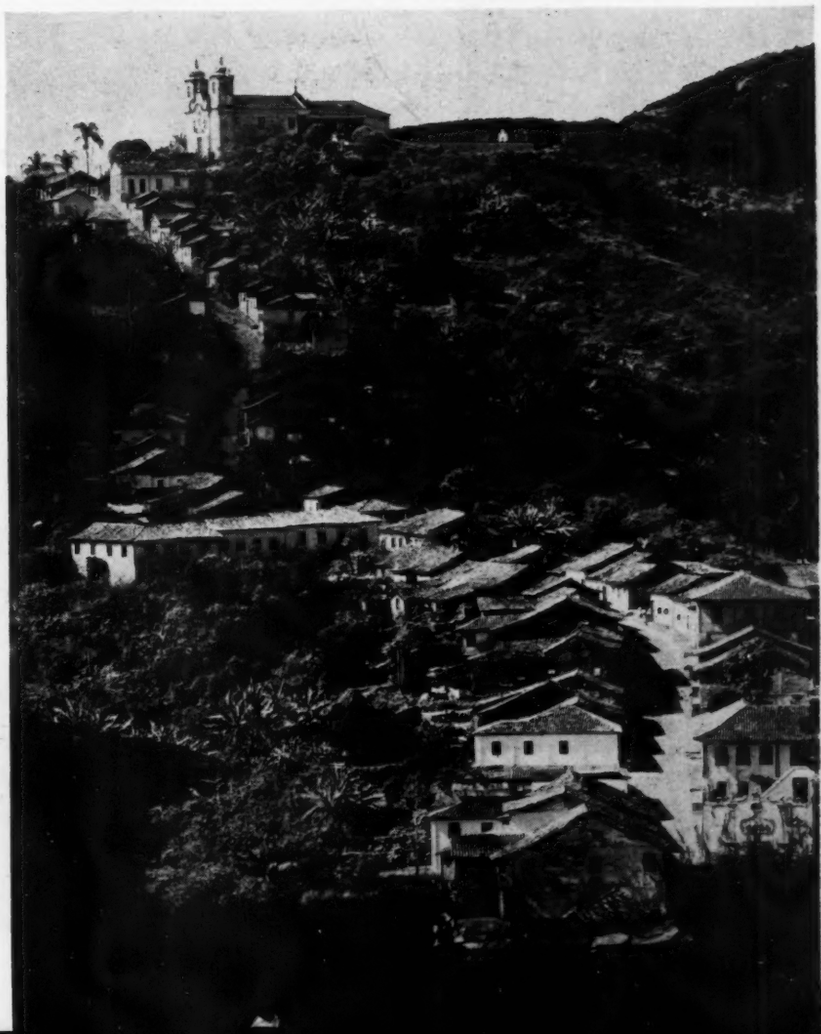

13. The Old City, Stockholm—"holding down the foreground." 14. Santos Dumont Airport, Rio de Janeiro. Correia Lima, Architect—"a strong foreground." 15. The Propylæa from the Erechtheum —"relate them to each other." 16. The Parthenon from the Propylæa—"given an impression of spatial composition." 17. Ouro Preto, Brazil—"a high camera angle."

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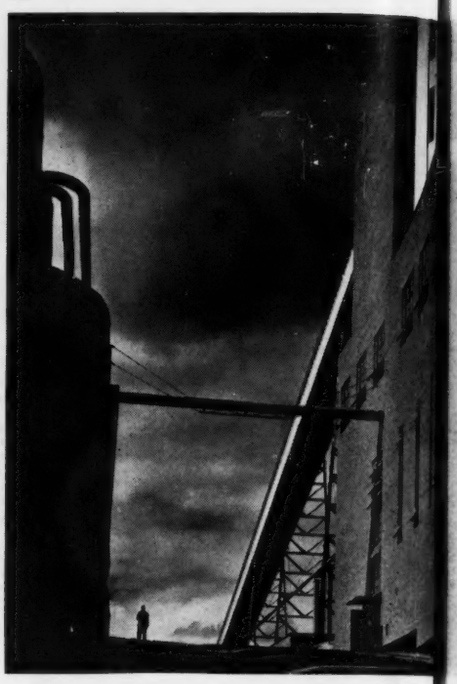
19



18. Fredhall Apartments, Stockholm—"try placing a friend in the picture." 19. Sunila Pulp Mill, Finland. Alvar Aalto, Architect—"including the subject from top to bottom." 20. Department of Sanitation, East River Drive, New York City—"the figure, used to lead the eye into the picture. 21. School, Stockholm. Paul Hedquist, Architect —"a surprising amount can be done with natural daylight."

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Progressive Architecture — Rich's, Inc.
Architectural Competition

PROGRAM

For the Design of

A Realistic House for a Family in Georgia

CLOSING DATE — JANUARY 21, 1946

PRIZES

First Prize	$ 3,000.00
Second Prize	1,500.00
Third Prize	1,000.00
Fourth Prize.	500.00
25 Mentions at $100 each .	2,500.00
Special Georgia Prize . . .	1,500.00
TOTAL . .	$10,000.00

JUDGES

Thomas Harlan Ellett, F.A.I.A., New York
Ernest A. Grunsfeld, Jr., F.A.I.A., Chicago
Richard Koch, F.A.I.A., New Orleans
Ernest J. Kump, A.I.A., San Francisco
Roy F. Larson, F.A.I.A., Philadelphia
Roland A. Wank, A.I.A., Detroit
Robert Law Weed, A.I.A., Miami

All parties to this competition agree that the Jury of Award has authority to make the awards and that its decisions shall be final.

This competition is open to all architects, architectural draftsmen, and architectural students. Under a ruling by the Committee on Competitions of the American Institute of Architects, Institute members are permitted to enter. Any contestant may submit more than one design. No employee of either Reinhold Publishing Corporation or the sponsors is eligible.

Authorized by Reinhold Publishing Corporation
Sponsored by Rich's, Inc., Atlanta, Georgia
Conducted by Henry J. Toombs, A.I.A., Professional Adviser and Kenneth Reid, A.I.A., Associate Professional Adviser

PROGRAM

Despite all the efforts made by architects and others to help solve the problem of the Small House, there seems to be some inherent difficulty that makes these attempts fall short of complete success. Like the pot of gold at the end of the rainbow the perfect small dwelling is yet to be discovered. The result is that, looking about the country, one finds that the vast majority of small houses are badly designed or badly constructed or both and that the best of them still have some faults, either in the eyes of their occupants or in those of their neighbors.

It is true that over the years there has been some improvement, which may be traced to the thinking that has been done in each decade by the best architectural designers. Wide publication of comparatively few examples of good houses actually built and of designs prepared for periodic competitions have helped in the gradual spread of improved planning ideas which are then adopted and imitated in houses built during the ensuing period.

Competitions, however, often result in winning designs which, though brilliant and helpfully prophetic, involve expensive construction beyond the pocketbook of the average family. Such designs also sometimes rely on the introduction of some special materials or equipment known to be in the research stage but unlikely to be economically available within the near future.

It is the wish of both **Progressive Architecture (Pencil Points)** and the sponsor, **Rich's, Inc.**, of Atlanta, Georgia, that this competition shall be a realistic one, seriously aimed to encourage design of small houses that will not only be "better" but within the reach of the $3,000-a-year white-collar family that wants to build a home right after the war.

Rich's, Inc., naturally vitally interested in the well-being of the state it serves, is thinking particularly of houses "good to live in in Georgia." Since the difference in climate between Georgia and all but the northern group of states is in degree only, however, it is probable that the resulting designs will have a broad application so that designers need not feel that the problem is of limited scope.

PROBLEM

To design a house that could really be economically built in the State of Georgia in the immediate post-war period out of building products known to have been on the market before the war or known to be actually ready for production when plants are re-converted. Beyond this limitation, plus consideration of a reasonable cost for the family of clients described, the designer is free to choose the materials and equipment he considers most appropriate.

The house is for an American family of four—father, mother, and two small children—a boy of five and a girl of two. Their income is $3,000 a year. For reasons of convenience to work, school, shopping, etc., their building site must be in an established residential section of a still growing city. Although they would like to have a larger piece of land, they can afford only an inside lot 60 feet wide and 150 feet deep. They have a choice of four approximately level lots of four different orientations—on the north or south side of a paved street running east and west, or on the east or west side of a street running north and south. You as their architect will guide their choice and will design their house and some appropriate type of garage to fit the site chosen.

After the lot is paid for, the family budget will allow the building of a house containing a maximum of 1,350 square feet of floor area for the house exclusive of a garage and a heater room which may be either above or below grade. Basements and usable attic floors must be included in this total area.

Local restrictions permit no part of the house to be nearer than 20 feet to the street or nearer than 10 feet to the side and rear lot lines. (Fences, however, and walls not exceeding 6 feet high may be built on the restricted part of the property.)

The clients for whom you are to design the house are average people who have been looking forward for a long time to having their own home. They have been studying the pages of current magazines and are sympathetically aware of the contemporary trend in design, especially in regard to its greater promise of comfort, convenience, and freedom from a good deal of household drudgery. They definitely do not wish conformity with any traditional "style." At the same time they are desirous that the house they build shall take its place gracefully among its older neighbors. They have an idea that a good architect can give them something that is thoroughly modern and thoroughly appropriate to the region, not at all stodgy and imitative, yet so well proportioned and pleasant of aspect that it will excite general admiration rather than amazement.

The designer will keep in mind not only the present needs of the family but its future needs as the children grow up. He should also have an answer to the problem of caring for an occasional guest or a visiting parent. Realizing that a house never has too much storage space, he will contrive in an attic or cellar or otherwise to provide at least 900 cubic feet of easily accessible and well-disposed storage space for the miscellaneous needs that occur in every ordinary household over and above the usual closets and kitchen cabinets.

The designer will keep in mind the Georgia climate which has a fairly wide range. It is generally accepted that an up-to-date house in Georgia is not comfortable in the winter without a heating system. (Gas is available in this area and is relatively cheap.) It can be very cold in winter and very hot in summer. March ordinarily sees the last of winter and the numerous flowering plants begin to bloom in the latter part of March. April brings full spring. May is warm and inclined to be hot towards its end. June, July, August, and most of September are definitely hot. One seeks the shade, particularly in the middle of the day. Spring and summer rains may be frequent and are apt to be sudden and heavy. Breezes in summer are most generally from the southwest, usually arise in the evening, and help to relieve the heat of the day. In October and November the leaves turn and the evenings are cool. December, January, February, and the early part of March are commonly cold and raw with occasional warm sunny days. The prevailing winter winds come from the northwest. There are freezes, sometimes of several weeks' duration, but there is litttle snow. Elevation above sea level ranges from 500 to 1,000 feet. Average temperatures, rainfall, and sunny days for the vicinity of Atlanta are as follows:

	WINTER	SPRING	SUMMER	FALL
AVERAGE OF MAXIMA	52°	70°	80°	70°
ABSOLUTE MAXIMA	78°	97°	103°	102°
AVERAGE OF MINIMA	36°	52°	69°	54°
ABSOLUTE MINIMA	8°	8°	39°	14°
TOTAL PRECIPITATION FOR DRYEST YEAR	9.4"	6"	12"	5.7"
TOTAL PRECIPITATION FOR WETTEST YEAR	26.7"	16"	14"	11.1"
AVERAGE HOURS SUNSHINE	463	700	814	696

The comfort of a house in Georgia would be increased by

(a) Cross ventilation. While exhaust fans are widely used to pull in cool evening air in summer they do not materially help daytime comfort. (It is assumed that summer air conditioning is not financially possible at this time to the family described.)

(b) Porches can be thought of as summer living rooms but to be useful they must be screened for insects (as all other openings must be). It should be noted that porches are not pleasant when flooded with summer sun.

(c) Terraces, shaded from the sun in summer and yet open to it in winter are most pleasant contributions to the enjoyment of out-of-doors.

(d) Trees and shrubbery, thoughtfully located, can materially contribute to the comfort, privacy, and pleasure of a Georgia home.

Considerations of the Jury of Award

(1) The architectural merit of the design, including its regional suitability and the skill with which the plans are worked out to fit the needs of the hypothetical client.

(2) Practicability and economy of construction, wherewith the client's budget may be met.

(3) The special prize will be awarded for the best house submitted by an architect or designer who lives and works in Georgia.

(4) The judges will not be influenced by quality of delineation.

COMPUTATION OF FLOOR AREA (Mandatory)

Measurement of enclosed spaces shall be taken from the inside of exterior walls with no deductions for partitions. Horizontal area occupied by stairs shall be counted as a part of the floor from which they rise. Open porches or screened porches shall be counted at half their full area. Entirely glassed-in porches shall be counted at their full area. Designs that exceed 1,350 square feet total floor area (exclusive of garage and heater room) will not be considered.

DRAWINGS (Mandatory)

All required drawings for each design shall be composed on a single sheet of opaque white paper, trimmed to exactly 25" x 36". The sheet is to be read with its long dimension vertical and shall contain the following items in **opaque black ink.** (No diluted ink, color, wash, airbrush, or applied transparent shading tissue.) All lettering shall be at least ⅛" high.

(1) Plans at ¼" equals a foot. The use and dimensions of each room or space shall be indicated so that they will be clearly legible when reproduced at one-quarter size. Suggested furniture arrangement shall be shown.

(2) Perspective of the house as seen from the street, rendered in ink with pen or brush and so laid out that true heights may be measured at a scale of ¼" = a foot on the corner nearest the observer.

(3) Elevations, at ⅛" equals a foot, of the two sides of the house not shown in perspective.

(4) Plot plan at any convenient legible scale showing location of house and garage and arrangement of the property.

(5) Separate single line diagram of floor plans at small scale indicating method of computing total inside floor areas.

(6) Drawings shall bear the title A REALISTIC HOUSE FOR GEORGIA with the subtitle PROGRESSIVE ARCHITECTURE—RICH'S, INC. COMPETITION and shall be signed with a device or *nom-de-guerre.*

(7) A single sheet of 8½" x 11" paper, to be enclosed with the drawing, shall contain a typewritten outline specification listing principal materials and items of equipment for the house.

(8) **Optional.** It would be interesting to include on the drawing, at small scale, a diagram showing how the same house might be placed on each of the three lots of different orientation which were rejected by the client upon your advice.

ANONYMITY (Mandatory)

Drawings shall contain no identifying mark other than a device or *nom-de-guerre*. Each drawing shall be accompanied by a plain opaque sealed envelope bearing the same device or *nom-de-guerre* as the drawing and containing a slip of paper on which the true name and complete address of the competitor are stated. In the case of drawings submitted by architects or designers now living and working in Georgia or by residents of Georgia now temporarily absent from the State because of war service, the accompanying envelope shall bear, in addition to the *nom-de-guerre*, a capital "G," lettered ½" high, on its upper right-hand corner. This is for the purpose of identifying to the Professional Adviser but not to the Jury the drawings eligible for the Special Georgia Prize. The envelopes will be opened by the Professional Adviser in the presence of the Jury, only after the awards have been made.

DELIVERY OF DRAWINGS (Mandatory)

The drawings shall be securely wrapped, either flat or in a strong tube not less than 2½" in diameter and addressed to Kenneth Reid, **Progressive Architecture—Rich's, Inc. Competition,** 330 West 42nd Street, New York 18, N. Y. In the case of drawings sent registered, competitors must not demand a return receipt. Drawings shall be delivered to the office of **Progressive Architecture** or placed in the hands of the post office or express companies not later than 6 P.M., standard time, Monday, January 21, 1946. Drawings will be accepted at any time before the close of the competition. They will be fully insured from the hour of their receipt.

Drawings are submitted at the competitor's risk but reasonable care will be exercised in their handling, safekeeping, and packaging for return.

EXAMINATION OF DESIGNS

The Professional Advisers will see that the drawings are expertly checked to insure that they comply with the mandatory requirements. No award will be made to any design that fails to comply. No drawing, whenever received, will be shown or made public until after the awards by the Jury.

JUDGMENT

The Jury of Award will meet at the Bon Air Hotel, Augusta, Georgia, on February 13, 14, and 15, 1946.

ANNOUNCEMENT OF AWARDS

The Professional Advisers will send by mail, to each competitor, the names of the winners of the Prizes and Mentions as soon as possible after the judgment. This information will be published in the March, 1946, issue of **Progressive Architecture.**

REPORT OF THE JURY

The winning designs and a full critical report by the judges will be published in **Progressive Architecture** for April, 1946. Each competitor will receive a copy of this report.

THE PRIZE WINNING DESIGNS

The designs awarded Prizes and Mentions are to become the property of the sponsors, who agree that whenever and wherever any of the drawings are published or exhibited, the names and addresses of the designers will be clearly displayed and all resulting inquiries will be forwarded to them. The sponsors further agree that any models that may be built from any of the designs for exhibition purposes will be faithfully executed in exact conformity with the original design.

The sponsor reserves the right to build, for demonstration purposes, one house from each of one or more of the premiated designs. In this event, the sponsor will pay to the architectural author of each design so used, a professional fee of six percent of the contract cost. This fee will be in addition to the Prize or Mention award. For this fee the recipient agrees to furnish a full set of contract working drawings, necessary details, and specifications, which must be adequate in the judgment of the Professional Adviser.

RETURN OF DRAWINGS

Non-premiated drawings which are not reserved for exhibition or publication will be returned in a reasonable time, postage and $50.00 insurance prepaid.

NOTICE TO COMPETITORS

Any competitor who has difficulty in securing paper of the size called for will be provided by **Progressive Architecture** with a sheet of Whatman's 133-pound Hot Pressed paper, Double Elephant size, for one dollar. The paper will be shipped prepaid in a tube suitable for remailing the finished design. Address remittance to **Progressive Architecture,** 330 West 42nd Street, New York 18, N. Y.

RADIANT HEATING LAYOUT SIMPLIFIED

BY R. G. VANDERWEIL, Heating Engineer

The author, who has had considerable experience in this country and abroad, is now Project Engineer with the Chase Brass & Copper Co. Aware of the inter-relationship between panel construction and other factors, he has reduced complicated theorems to charts and graphs, taking into account materials of which panels are built.

I. THE FLOW OF HEAT IN PANEL HEATED ROOMS

Room Heat Flow

However complicated the theory, heat flow in a room may be visualized by a very simple diagram, such as **Fig. 1.** Heat supplied by means of a ceiling panel is transmitted by conduction through the panel (wave lines) and from the panel surface by convection (C_a) to the room air, and by radiation (R_1 and R_2) to the outside wall and glass, or *dissipating surface,* as well as to the inside of neutral surfaces. The neutral surfaces cannot absorb heat, and for this reason reflect it by radiation (R_3) to the dissipating surface and by convection (C_b) to the room's air. The air in turn loses the heat gained from the panel and neutral wall to the dissipating surface, C_c.

For certain simplifying assumptions, the graphic representation of the panel's heat output proves even simpler and is given in **Charts A and C.**

Room Temperature Conditions

It is well known that the air in rooms heated by panels is of lower temperature than in conventionally heated rooms. However, this depression of the air temperature is often greatly overestimated; it usually amounts to only 2F to 5F. Together with this lower air temperature, a higher temperature of the room enclosures *(MRT)* is met in radiant heated rooms, which in combination with well distributed low temperature heating surfaces, explains the excellent health and comfort conditions that have caused so many Continental schools and hospitals to adopt radiant heating.

Expressed in terms of heat flow there is a distinct difference in the radiation output of conventional and radiant heating systems. Less than 20% of a radiator's output is transmitted to the room by radiation. This radiation component increases to about 50% in rooms heated by floor panels and to 65% in rooms using ceiling panels. Comparing the total heat output by convection and radiation of floor and ceiling panels, it will be seen that due to restrictions imposed upon the temperature of floor panels, the ceiling panel proves more economical. In rooms of 70F the floor panel output is restricted to approximately 40 Btu hr, per sq ft of panel; while the ceiling panel output may prove to be 70 Btu hr per sq ft or more. The radiant principle may be carried to an extreme—possibly desirable in tuberculosis hospitals, etc.—by supplying great amounts of cool air to the room. Only under these conditions is it possible to provide room air temperatures of 60F or less, which, combined with an MRT of 80° or more, will still result in comfort conditions. In this case, Charts A and C cannot be used.

Location of Panel

Advantages and disadvantages inherent in floor, wall, and ceiling panels are so evenly distributed that the selection of the heated surfaces requires careful study.* No hard and fast rule can be given as to the selection of location; each case must be considered alone.

Panel Heat Flow

Although little difficulty was encountered in presenting a simplified graphic room heat flow solution, the development of such a solution for panel heat flow proved to be a tedious task. The author tried to apply a number of simplifying assumptions to heat flow from tube to panel surface, but whenever test data and theory were compared, the assumptions proved to be in vigorous disagreement with actual conditions. He finally resorted to the basic theory of flow—which like all laws of nature is simple—and stated that heat at any point of the heating panel "flows" perpendicular to the isotherms (lines of constant temperature) just as water at any point on a hill flows perpendicular to the contour lines (lines of constant elevation). This law may be expressed more simply by the statement that wherever "flow" occurs, it must progress in the direction of least resistance, or along the steepest slope.

Fig. 2 shows in cross-section a panel of constant conductivity throughout (e.g., concrete floor). The measured temperatures at various cross-sections of the panel were plotted and points of same temperature connected by heavy red lines—the *isotherms.* Perpendicular to these are *heat-flow lines,* shown in black. The equations representing this panel flow are complicated, but could be solved and plotted in graphs for various panels.

Fig. 3 shows such a graphic solution for a well insulated roof, R1, with tubes embedded in gypsum plaster; and **Fig. 4** shows one for a simplified case in which the coil is embedded in concrete on dry ground. It may be used for any finished floor structure but only if no "reversed" heat flow (see **Fig. 2**) is met; that is, only for panels on the ground. In panels located in intermediate floors, roofs, or walls, heat leaves the tube in two principal directions and the conditions become so involved that a number of graphs similar to Fig. 3 had to be developed. **Fig. 2** shows that in a ceiling panel the greater part of the heat is conducted through the lower part of the panel and supplied to the room, but also that some of the heat leaving the tube flows in the reverse direction, upward and into the space above. With panels in intermediate floors, this heat is usefully applied to the upper floor; with roof panels, it is lost.

*See "Locating the Panel in Radiant Heating Systems," by R. G. Vanderweil, *Heating and Ventilating,* April 1945.

II. LAYOUT OF RADIANT HEATING SYSTEM EXPLAINED BY A PRACTICAL EXAMPLE

Fig. 5 shows a residence to be heated. Basic design considerations are comfort and efficiency of fuel consumption. The transmittance of the walls is given by U = .17, double glass is provided throughout and the roof is insulated so as to give a coefficient of transmittance of .08. This low coefficient is of importance whenever it is planned to install panels in the roof.

The owner has expressed the desire to provide for low room air temperature, if possible (that is, high rate of radiation output) and for this reason ceiling panels will be selected where possible. In rooms with sloping ceilings, where the air has a tendency to move to the highest point, the coils will be located

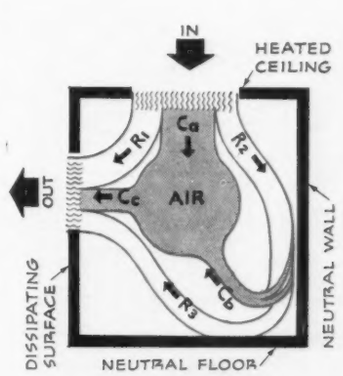


Fig. 1, above: Room heat flow

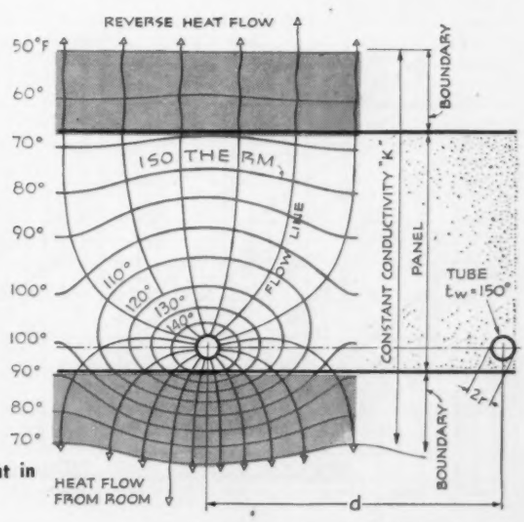


Fig. 2, right: Flow of heat in the panel

at the lower part of the ceiling. Extra consideration is given to the children's rooms. With young children it is desirable to provide floors of high temperature; for this reason panels there will be located in the floor. If in any room the heat requirement cannot be covered by the panel surface selected as above, supporting panels will have to be arranged.

Assumption of Panel Surface Temperatures (t_h)

In order to achieve an economical layout, surface temperatures should be as high as possible. They are, however, restricted by comfort considerations. In rooms with low ceilings, the mean temperature is assumed to be 105F; and in rooms with sloping ceilings, 110F, which surface temperature will still result in excellent comfort conditions up to an elevation of 7'6" above the floor and even higher near the monitor. Assumed floor panel temperature is 85F.

Panel Heat Output

With room temperatures known—75F in the bathroom, and 70F everywhere else—and panel temperatures selected, the various panels' heat output may be read off **Panel Output Charts A and C.**

TABLE I—PANEL HEAT OUTPUT "QI" BTU/SQ.FT.,HR. FOR VARIOUS SELECTED SURFACE TEMPERATURES

	CEILING PANEL SURF. TEMP. °F.		FLOOR PANEL SURF. TEMP. °F.
ROOM TEMP., °F.	110	105	85
70F	62	53	30
75F	—	45	—

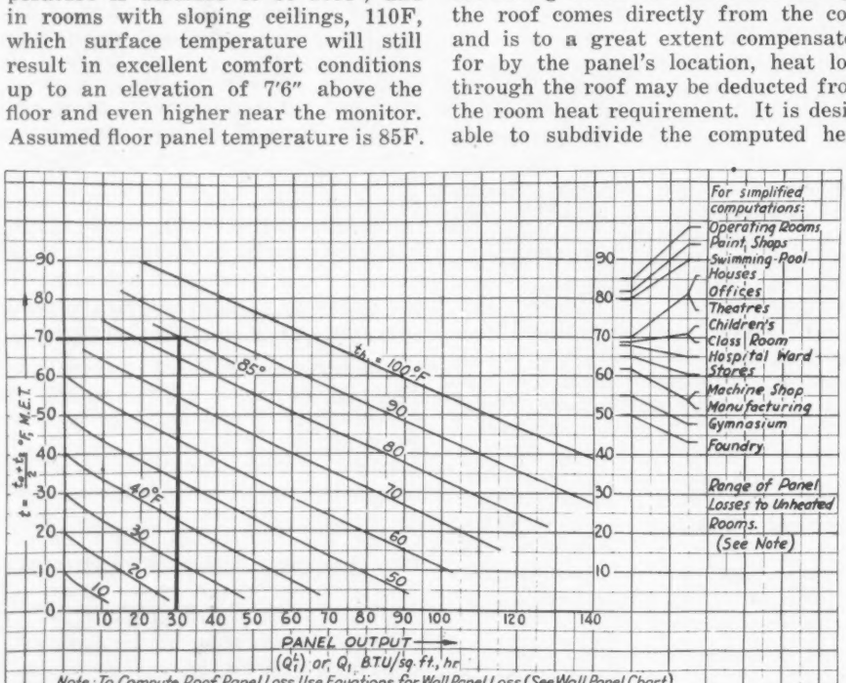
Room Heat Losses and Panel Size

Since whenever the panel is located in the ceiling whatever heat is lost through the roof comes directly from the coil, and is to a great extent compensated for by the panel's location, heat loss through the roof may be deducted from the room heat requirement. It is desirable to subdivide the computed heat losses as shown in *Table II, left.* In rooms where both floor and ceiling panels are used, floor and ceiling heat losses are shown in separate columns.

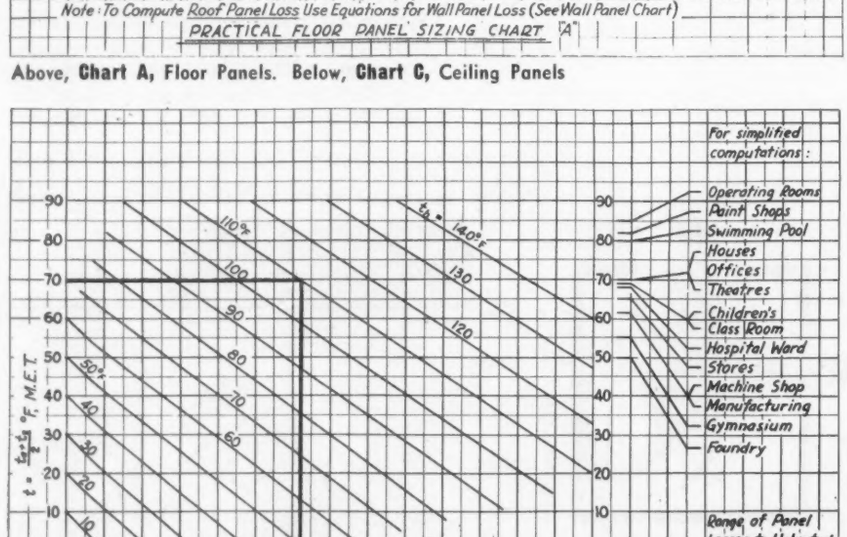
In order to determine which rooms require both floor and ceiling panels, the maximum available panel area as previously selected, and the maximum panel output obtainable, are noted on the *right-hand* side of *Table II.* (Output is found by multiplying the *areas* in Column 6 by the appropriate *unit panel heat output given in Table I.)*

All computations were made by slide rule and the figures are rounded out. Cols. 1, 2, and 3 show individual losses computed according to the ASHVE *Guide.* Col. 4 shows the sum of all losses. 35,650 Btu hr would represent the total room heat requirement if the rooms were heated by conventional methods. If the ceilings of the first four rooms and the floors and ceilings of the last three rooms were entirely covered by panels, the room heat requirement would be 30,200 Btu hr. Since the heating panels should not extend too close to the outside walls, in order to avoid excessive losses, they will not cover the entire floor or ceiling area and for this reason the + sign is used in Col. 5.

Comparing the room heat requirement (Table II, Col. 5) with the available heat from one panel (Col. 8), it will be found that the last three rooms require both floor and ceiling panels. Although the high heat loss of the corridor could be compensated for by increasing the size of the living room panel, this would result in a cold zone near the south entrance door. Consequently this alternate solution is disregarded, and a supplemental floor panel is used at the door. With all final decisions as to panel locations made, little effort is required to substitute the values in Table III, and decrease or increase the actual panel areas (Table III, Cols. 2 and 5) in order to obtain a balance between panel heat output and room heat loss (Cols. 16 and 15). Again, slide rule accuracy is considered sufficient and errors in the balance of plus or minus 2% are neglected. Cols. 2 and 5 show final panel areas obtained after balancing. Cols. 3 and 6 give panel unit output according to Table I, and Cols. 4 and 7 the total panel output obtained by multiplying the area by the unit output. Cols. 8 and 14 give the room's total ceiling and floor areas, Col. 9 the balance between Col. 8 and Col. 2, that is, the unheated ceiling area. Ceiling heat loss, Col. 10, is determined by multiplying the unheated areas, in sq ft (Col. 9) by the unit heat loss of the roof, 5.6 Btu sq ft (Q_{L_1}=desired temperature times conductance = $\triangle$ t x C = 70 x .08 = 5.6). Similarly, Cols. 13 and 12 are computed. The arrows in these columns indicate that the floor loss in the first four rooms is included in Col. 11; Col. 15 is the sum of Cols. 10, 11, and 12; Col. 16 the sum of Cols. 4 and 7.



Above, **Chart A,** Floor Panels. Below, **Chart C,** Ceiling Panels



Coil Layout, Tube Spacing and Diameter

According to previous specifications the surface temperature of all high (sloping) ceilings should be: $t_h = 110F$. Reading the table at the lower left of Fig. 3, the reference temperature t_r for Zero outside temperature, equals $t_h - 69.5$ or 40.5F. Now, connect the room temperature at the left-hand scale of the figure, 70F, with $t_r = 40.5$—full line—and read the results, some of which are shown in Table IV under $t_h = 110$, from the intersection of this full line with the center diagram.

Similarly, several possible solutions are found for the cooler ceiling panel with $t_h = 105$, $t_r = 105 - 69.5 = 35.5F$ and $t = 70F$—see dashed line in Fig. 5—and tabulated under $t_h = 105F$.

t_w of Figs. 3 and 4 signifies the mean water temperature; **d** the tube spacing; **2r** the nominal tube diameter. t_b of Fig. 3 represents the temperature of the "opposite" panel surface, the roof.

Obviously the finally selected ceiling and floor panels will have to operate with the same mean water temperature (t_w of Table IV), but may use various tube diameters (2r) and tube center spacings (d). In order to enable us to pick the most favorable water temperature Table IV finally shows, under $t_u = 85F$, several combinations of d, 2r, and t_w, for the floor panel. These combinations were taken off Fig. 4 which was used because the floors, in the rooms to be heated by floor coils, rest over the unexcavated basement. The value "a" ($=a' + x_1 (12/k_1) + 12/C_1$) in Fig. 4 is computed for the floor structure shown in Fig. 7 as: $a = 1\frac{1}{2} + .75\ (12/1) + 12/1.1 = 21.4$ and the results are read as indicated in full lines in Fig. 4.

Table IV indicates that, due to a relatively heavy "insulating layer" (finished floor) on the concrete floor, it is possible to select a relatively high water temperature, for instance $t_w = 145F$, without exceeding a floor surface temperature of 85F. Herewith all three panels are given as follows: Water temperature 145F, tube diameter ⅜" nominal on the following center spacings; 5¼" in the ceiling panels of 110F surface temperature; 6½" in the ceiling panels of 105F surface temperature; and 12" on the floor panel of 85F temperature.

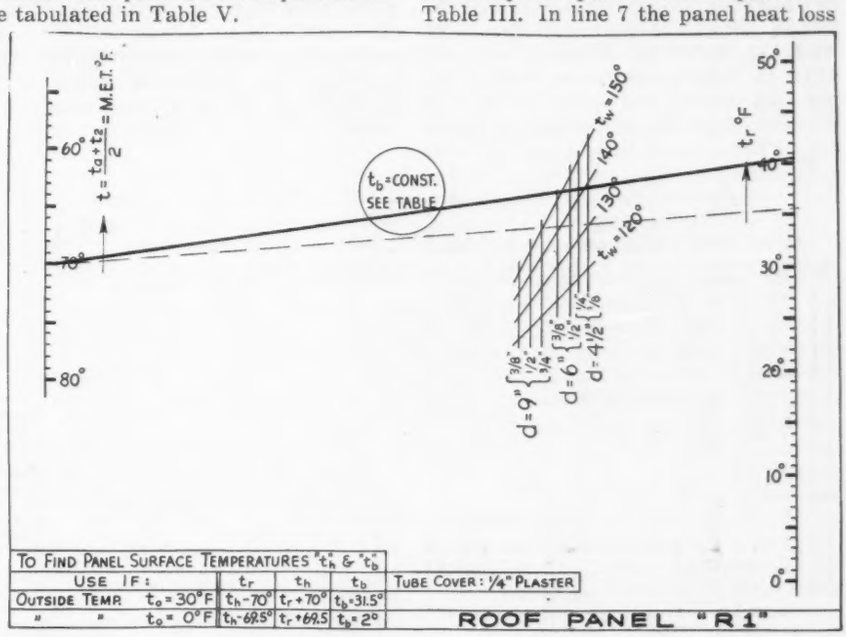
The bathroom, because of its higher design temperature (75F) is provided with a ⅜" coil at 7¼" centers according to Fig. 3.

⅜" tubes were selected throughout because tubes of this diameter may be buried in plaster of standard thickness.

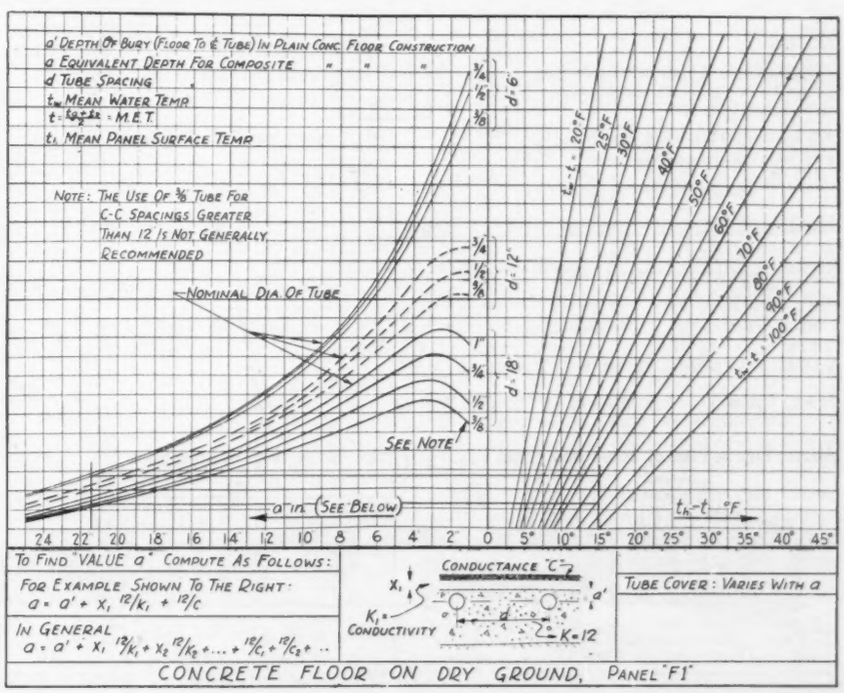
Reverse Heat Flow

The last step in the coil layout is concerned with computation of the reverse heat flow (see Fig. 2) which, in a one story building, is equivalent to the panel's heat loss since all heat flowing either upward in the ceiling panels, or downward in the floor panels, is lost. The heat loss in panels on dry ground may be assumed to be 10% of the panel output, the losses of the ceiling panel may be computed if the surface temperature of the "opposite" or "reverse" surface (in this case the roof) is known. This temperature, t_o, may be found and is noted on Fig. 3. It is constant for this particular panel. For an outside temperature of zero, it is 2F according to the table at the lower left of Fig. 3. Since the air film coefficient for outside walls and roof, according to the ASHVE *Guide*, is 6 Btu sq ft °F hr, the heat loss is: (2-0) + 6 = 12 Btu/sq ft hr. With the heat losses per sq ft known, the individual panel's heat requirements are tabulated in Table V.

Furthermore, Table V gives the data required later for computing pipe sizes. Its first line is copied from Table III, its third line indicates the previously computed center distance of the tubes and the fourth line the number of parallel tubes in the coil. According to Fig. 5, the over-all dimensions of the coil are noted in line 2; for instance, 6.6 × 13.56 = 89 sq ft for the kitchen. Since the heated panel field of the two outermost tubes extends to both sides of these tubes, the total panel surface is 95 sq ft rather than 90 sq ft. For the same reason all other areas computed according to line 2 are smaller than those of line 1. Line 5 gives the equivalent length of the pipe coils plus the bends, line 6 the computed panel heat output from Table III. In line 7 the panel heat loss


$t = \frac{t_a + t_2}{2}$ = M.E.T. °F.
t_b = CONST. SEE TABLE
t_w = 150°
140°
130°
120°
t_r °F
d = 9" 3/8" 1/2" 3/4"
d = 6" 3/8" 1/2" 1"
d = 4½" 1/4" 1/8"
TO FIND PANEL SURFACE TEMPERATURES "t_h" & "t_b"
USE IF: | t_r | t_h | t_b | TUBE COVER: ¼" PLASTER
OUTSIDE TEMP. t_o = 30°F | t_h-70° | t_r+70° | t_b=31.5°
" " t_o = 0°F | t_h-69.5° | t_r+69.5 | t_b= 2°
ROOF PANEL "R1"

Above, Fig. 3, Roof Panel. Below, Fig. 4, Concrete Floor Panel on Ground


a' DEPTH OF BURY (FLOOR TO ℄ TUBE) IN PLAIN CONC. FLOOR CONSTRUCTION
a EQUIVALENT DEPTH FOR COMPOSITE " " "
d TUBE SPACING
t_w MEAN WATER TEMP.
$t = \frac{t_a + t_2}{2}$ = M.E.T.
t_r MEAN PANEL SURFACE TEMP.
NOTE: THE USE OF ⅜ TUBE FOR C-C SPACINGS GREATER THAN 12 /s NOT GENERALLY RECOMMENDED
NOMINAL DIA OF TUBE
SEE NOTE
a' IN. (SEE BELOW)
$t_r - t_1$ °F
$t_h - t_1$ °F
TO FIND "VALUE a" COMPUTE AS FOLLOWS:
FOR EXAMPLE SHOWN TO THE RIGHT:
$a = a' + x_1\ ^{12}/_{k_1} + ^{12}/_{C}$
IN GENERAL
$a = a' + x_1\ ^{12}/_{k_1} + x_2\ ^{12}/_{k_2} + \ldots + ^{12}/_{C_1} + ^{12}/_{C_2} + \ldots$
CONDUCTANCE "C"
CONDUCTIVITY
K=12
TUBE COVER: VARIES WITH a
CONCRETE FLOOR ON DRY GROUND, PANEL "F1"

is marked, based on 12 Btu sq ft hr for ceiling panels and the aforementioned 10% for floor panels. Line 8, sum of 6 and 7, gives the total heat input into the coil and line 9 the circulating water required per coil per hour. Line 9 is obtained by dividing the values of line 8 by 30, 30F being the temperature drop of the water in the coil and also the Btu's delivered by one pound of circulating water. This value is allowable for all ceilings and all well insulated floors.

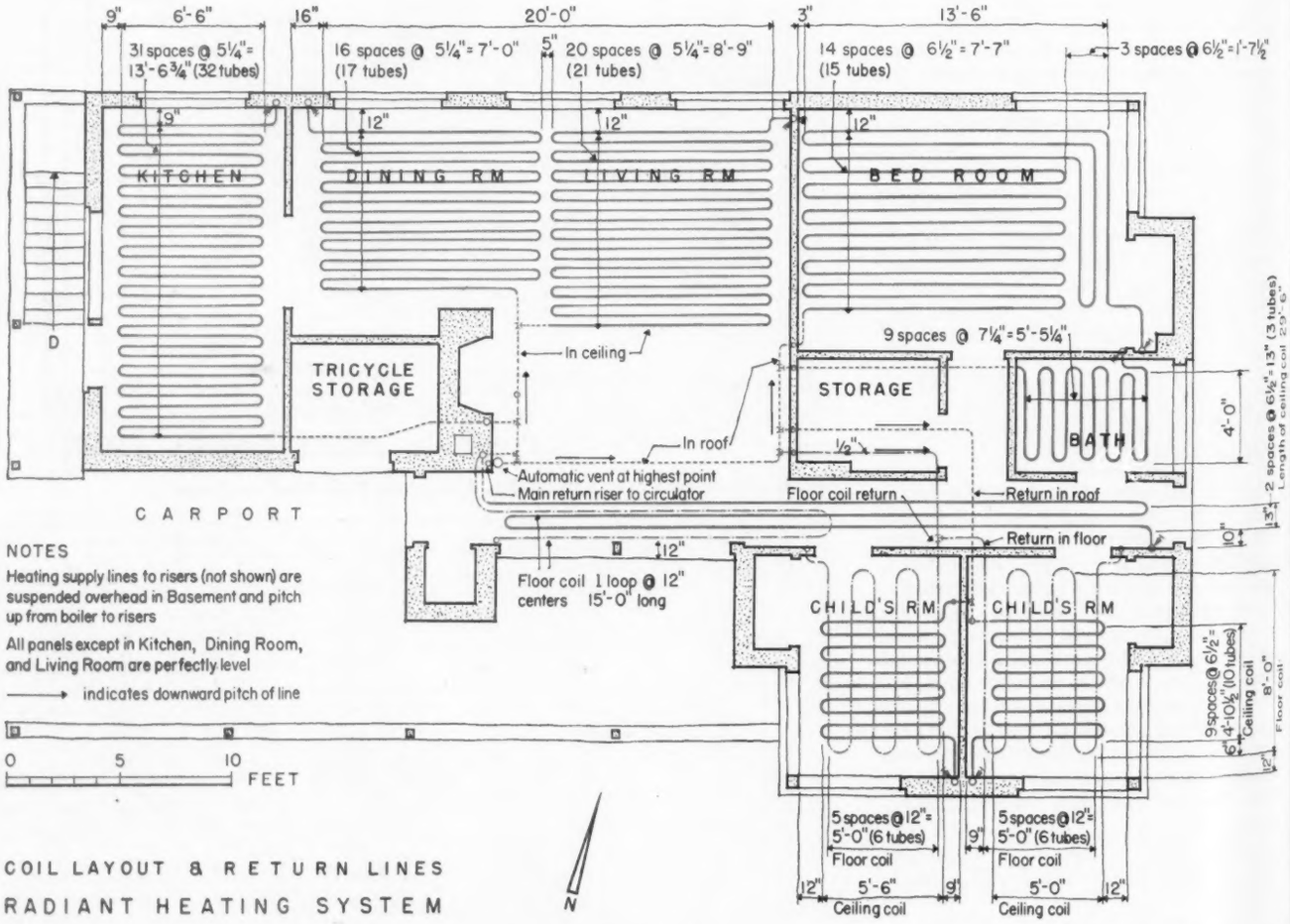
Pressure Drop in Coil, Pump, and Boiler

A number of tables and graphs are available giving the pressure drop per ft of ⅜" nominal (and other) tubes in inches for any given flow rate through the pipe, lb/hr, as noted in Table V, line 9. By multiplication of this value with the equivalent length of the coil (line 5) the total pressure drop in the coil is obtained and noted in line 10. Finally, by adding all individual panel heat inputs (line 8), their total, 39,050 Btu hr, is obtained and the boiler may be selected accordingly. The booster pump capacity is $(39050 \times 1.2)/30 =$ 1560 lb/hr, at which load pumps of from 5 to 12 ft pressure head are available. In order to find the actual pressure head of the pump, it is necessary to size the piping according to conventional procedure. Due to space restrictions, it is not possible to describe this sizing step for the given example; however, it should be noted that the pressure drop in the largest coil is 150" or 12.5 ft which is too great for a small circulator. For this reason, the living room coil was divided into two coils of approximately equal over-all dimensions, resulting in a small pressure drop for each coil. The remaining largest drop is in the kitchen and amounts to 44" or 3.67 ft; and sufficient pressure drop remains to properly size the connecting piping, if selecting a pump of approximately 7 ft head.

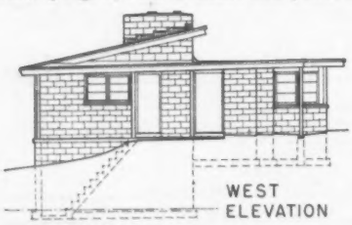
Discussion of Layout, Fig. 5

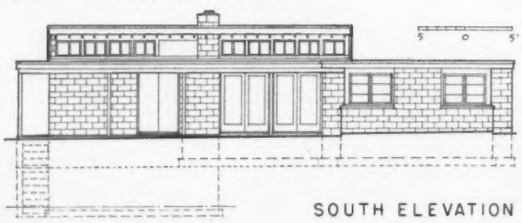
Ceiling coils are shown in full lines, floor coils in dot-dashed lines and all returns in dashed lines. The over-all center line dimensions of each coil are noted. As previously mentioned, the heated panel area is greater than the coils' outer center line dimensions; for this reason lines 1 and 2 of Table V differ. In the course of the layout, it seemed feasible to provide only three parallel tubes in the corridor ceiling.

The resulting 'total heated" ceiling area of this coil is still smaller than the required 56 sq ft noted in Table V and for this reason the total heated area of the corridor's floor (2 x 16 = 32 sq ft) is increased over the 24 sq ft of Table V. All coils are laid out level, except in kitchen and living room, and are supplied by heated water, rising from the mains below. Their return lines are lifted to the roof level and are there connected to a return header which is

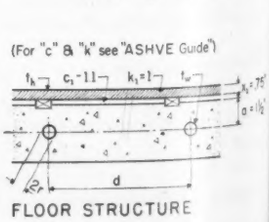


Above, Fig. 5, Plan of house and panel heating system. Below, Fig. 6, Elevations





Below, Fig. 7, Floor panel



vented at its highest point. The drain of the automatic vent should be extended to the nearest plumbing or to the roof drain. The regulating valves are indicated in the supply line to each ceiling panel. They are installed behind wall plates. It was not considered essential to regulate the floor coils, since in all rooms heated by such coils, the greater portion of heat is supplied by the ceilings. ⅜" nominal type L soft copper tubing is used throughout. In the kitchen and living room coils, which slope with the ceiling, water is supplied at the coil end near the outside wall of north exposure. In the bedroom, the coil is shaped in such a manner that its high temperature section—near the point of water supply—runs along both outside walls. Such a layout is proper but is impossible in the kitchen due to its sloping ceiling. Provision of the coils in the corridor will amply compensate for leakage through the doors. The boiler expansion tank, hot water heater, and main distribution lines as well as the return line to the pump, are all located in the cellar (which is partly unexcavated) and are of conventional design and not shown due to lack of space. The mixing valve at the boiler is used to reduce the heating water temperature yet maintain the temperature of domestic hot water. It is governed by indoor and outdoor thermostat. If the mixing valve fully bypasses the boiler, the circulating pump is turned off.

TABLE II—TO FIND SUPPLEMENTARY PANEL AREAS

ROOM	COMPUTED HEAT LOSS				AVAILABLE OUTPUT OF ONE PANEL PER ROOM			
	1 FLOOR LOSS BTU/HR.	2 ROOF LOSS BTU/HR.	3 ALL OTHER LOSSES BTU/HR.	4 TOTAL BTU/HR.	5 APPROX. HEAT REQUIREMENT WITH ONE PANEL ONLY	6 AVAIL. PANEL AREA SQ/FT	7 PANEL TEMP. °F.	8 AVAIL. PANEL OUTPUT BTU/HR.
KITCHEN	INCLUDED IN COL. 3	750	5,700	6,450	CEILING PAN. 5,700+	94	110	5,820
L.R. & D.R.		1700	9,000	10,700	" 9,000+	224	110	13,900
BED.R.		1000	5,550	6,550	" 5,550+	126	105	6,680
BATH		200	1,150	1,350	" 1,150+	26	105	1,170
CORRIDOR	200	500	3,400	4,100	" 3,600+	56	105	2,960
WEST CHILD.	150	400	2,800	3,350	FLOOR PAN. 3,200+	48	85	1,440
EAST CHILD.	150	400	2,600	3,150	" 3,000+	48	85	1,440
	500	4950	30,200	35,650				

TABLE III—(FINAL PANEL SIZES SHOWN IN COLS. 2 and 5.)

	PANEL'S HEAT OUTPUT						ROOM'S HEAT LOSS								
	CEILING			FLOOR			CEILING			OTHER	FLOOR			BALANCE	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	AREA	UNIT OUTPUT	TOTAL OUTPUT	AREA	UNIT OUTPUT	TOTAL OUTPUT	TOTAL CEIL. AREA	UNHT'D CEIL AREA	HEAT LOST THRU UNHT'D CEIL. AREA	ALL OTHER LOSSES FROM TABLE II COL. 3	HEAT LOST THRU UNHT'D FLOOR AREA	UNHT'D FLOOR AREA	TOTAL FLOOR AREA	ROOM HEAT LOSS TOTAL	PANEL HEAT OUTPUT TOTAL
	SQ. FT.	BTU/SQ. FT.	BTU/HR.	SQ. FT.	BTU/SQ. FT.	BTU/HR.	SQ. FT.	SQ. FT.	BTU/HR.	BTU/HR.	BTU/HR.	SQ. FT.	SQ. FT.	BTU/HR.	BTU/HR.
KITCHEN	95	62	5900	—	—	—	131	36	200	5700	←———	———	119	5900	5900
L.R. & D.R.	160	62	9900	—	—	—	315	155	865	9000	←———	———	289	9865	9900
BEDR.	112	53	5920	—	—	—	163	51	285	5550	←———	———	163	5835	5920
BATH	26	45	1170	—	—	—	33	7	40	1150	←———	———	33	1190	1170
CORRIDOR	56	53	2970	24	30	720	87	31	175	3400	125	63	87	3700	3690
W.CHILD.	32	53	1700	48	30	1440	77	45	250	2800	60	29	77	3110	3140
E.CHILD.	28	53	1480	48	30	1440	77	49	275	2600	60	29	77	2935	2920

TABLE IV—VARIOUS COILS, Resulting in the Desired Panel Surface Temp.

	t_h = 110°F.					t_h = 105°F.			t_h = 85°; ($t_h - t$) = 15°		
t_w	138	143	145	146	152	135	141	145	138	145	158
2r	⅜	¼	⅜	½	⅜	½	⅜	⅜	⅜	⅜	½
d	4½	4½	5¼	6	6	6	6	6½	6	12	18

TABLE V—TOTAL HEAT REQUIREMENT AND SCHEME FOR PRESSURE DROP CALCULATION

ROOM	KITCHEN	L.R. & D.R.	BED R.	BATH	CORRIDOR		WEST CHILD.		EAST CHILD.		COLUMN
					CEIL.	FLOOR	CEIL.	FLOOR	CEIL.	FLOOR	
SQ.FT. PANEL AREA	95	160	112	26	56	24	32	48	28	48	1
COIL OVERALL DIMEN.	6.6x13.56	7.8x20	7.6x13.5	4x5.44	1.1x28.5	1x15	4.88x5.5	5x8	4.88x5	5x8	2
TUBE CENT. DIST.	5¼"	5¼"	6½"	7¼"	6½"	12"	6½"	12"	6½"	12"	3
No. OF STR'T RUNS	32	19	15	10	3	2	10	6	9	6	4
EQUIV. LGTH. PIPE COIL PLUS BENDS	260	440	240	60	130	40	70	60	65	60	5
PANEL HEAT OUTPUT	5900	9900	5920	1170	2970	720	1700	1440	1480	1440	6
PANEL HEAT LOSS	1140	1900	1300	310	670	70	380	150	340	150	7
PANEL HEAT INPUT	7040	11800	7220	1480	3640	790	2080	1590	1820	1590	8
CIRCUL. LB/HR.	235	360	240	50	120	30	70	55	60	55	9
TOTAL PRESS. DROP	44	150	43	SMALL	6.5	SMALL	SMALL	SMALL	SMALL	SMALL	10

III. GENERAL NOTES ON PIPING AND INSTALLATION

Pipe Sizes

As previously mentioned, pipe sizing procedure is entirely the same as that used with conventional heating systems.

Layout of Piping, Drain, and Vent

Again the layout conforms to the conventional hot water layout. However, *special* care should be taken to provide for a continuous slope of the piping from the boiler to the highest point of the system. The coils proper have to be laid out perfectly level and for this reason it is advisable that the air, in any other point of the piping system, can escape freely, if possible in the direction of the circulating water.*

Regulating the Flow in the Piping System

If, in the pipe sizing process, all circuits were sized carefully to result in a balanced pressure drop throughout each individual circuit, no individual plug cocks or orifices are required in the coil connections. In this case a regulating valve for each panel, preferably located in a closet or behind a wall plate, will suffice. If the system is not carefully balanced by computation or in cases where it seems undesirable to use very small piping sizes in order to balance the system, plug cocks or orifices should be installed in series with the regulating valves.

Coil Installation

Particular care should be given to the *level* installation of coils. Floor coils are usually laid out freely, either on a concrete layer or on the reinforcing mesh. In the latter case, they may be attached to the mesh. Ceiling coils, when made of copper, are usually formed on the floor, lifted to their final location and attached under the metal lath to joists or furring strips by straps.

Testing the Panel

Before the coils are embedded in concrete or plaster, they must be tested for level layout as well as for leaks. Each coil should be exposed to a hydraulic pressure of 300 psi (or, in high buildings, to a pressure exceeding the combined static and dynamic by 100 psi). No pressure drops due to leaks should occur during a two- to three-hour testing period. In order to avoid damage, all coils should be embedded in concrete or plaster immediately after conclusion of tests.

*For further details see "Panel Layout and Coil Installation for Radiant Heating Systems," by R. G. Vanderweil, *Heating and Ventilating*, July and August 1945.

THE ACOUSTICS OF MUSIC SHELLS — Part II

By HENRY L. KAMPHOEFNER, A.I.A.

This is the second and concluding portion of Professor Kamphoefner's article. It deals with the theory and design of shells for large audiences.

SIDE WALLS?

Vern O. Knudsen, Professor of Physics at the University of California at Los Angeles, began a series of calculations in his book *Architectural Acoustics*, which shows the distribution of average speech in front of a stage enclosed by a flat vertical rear wall, diverging side walls, and a sloping ceiling. F. L. McMillan, Graduate Assistant in the Department of Physics at the University of Oklahoma, has extended and continued the calculations of Mr. Knudsen in an effort to show the properties of the simple reflecting shell and to determine whether or not the efficiency of the shell is increased by the addition of diverging sides.

Figs. 17 through 26 show sound intensities at various points in the theater due to the presence of the shell.

The total effect at any one point is here taken to be the sum of effects caused by the primary source and the several effective images. A point source having an acoustical output of one hundred microwatts is placed at various locations in front of the shell, whose walls have a coefficient of reflection of 0.96. The sound energy at any point can therefore be found by means of the inverse square law.

Three positions of the sound source are given consideration here. This method can only give a first approximation; as only primary images are used in the calculation, the sound levels given at the various points are only approximately correct. Since acoustical images are not as clearly defined as optical images, only the first order images have been considered. Variations in sound intensities due to the interference of the primary sound wave and reflected sound waves are herein neglected.

SOUND IMAGES AND THEIR EFFECTS

First, it is of value to present a few qualitative considerations. In general, the image I_3 will affect the entire auditorium. "The cone of influence" of I_3 can be seen from **Figs. 17 and 18** to depend on the extent of the rear reflecting surface and the location of the source. I_1 and I_2, the images of the source in the diverging side walls, will affect various parts of the auditorium depending upon the angle of diversion of the walls and the location of the source. I_4 will in most cases produce no beneficial effects as its "cone of influence" passes above the audience (**Fig. 20**). The image I_5, of the source in the sloping ceiling, will depend upon the extent of the ceiling and the angle of slope (**Figs. 19 and 20**).

From a quantitative point of view, only slight changes in sound levels at various points occur with differences in locations of the source. It is also shown that the absence of the diverging side walls changes only slightly the distribution of sound energy. This is probably due to the fact that at large distances from the source the images I_1 and I_2 are somewhat farther away from the source and therefore produce only relatively small effect.

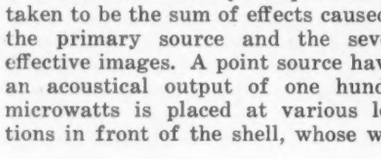
In **Figs. 17 through 26** the figures shown are sound levels in decibels due to the source plus the images shown.

One precaution should be employed in location of the source with respect to the reflecting surfaces. If the source is placed at too great a distance from the reflecting surfaces, or about 50 to 65 feet, troublesome echoes and resulting interferences will follow.

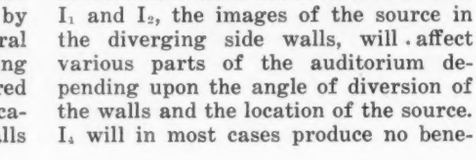
It may be said that the distribution of sound energy, at least for the first approximation, is independent of the location of the source and that the presence of the diverging side walls does not increase the efficiency of the shell enough to justify the expense of their construction.

MORE RECENT EXAMPLES

Several shells have been built during the last few years in which a flat rear wall, sloping ceiling, and diverging side walls have been used. Since the results of calculations herein show that diverging side walls do not increase the efficiency of the shell, they are, of course, not recommended as an addition to the sound shell. However, this form has been used in both the Ra-



Figs. 17 (left) and 18 (right)



Figs. 19 (left) and 20 (right)

Fig. 21

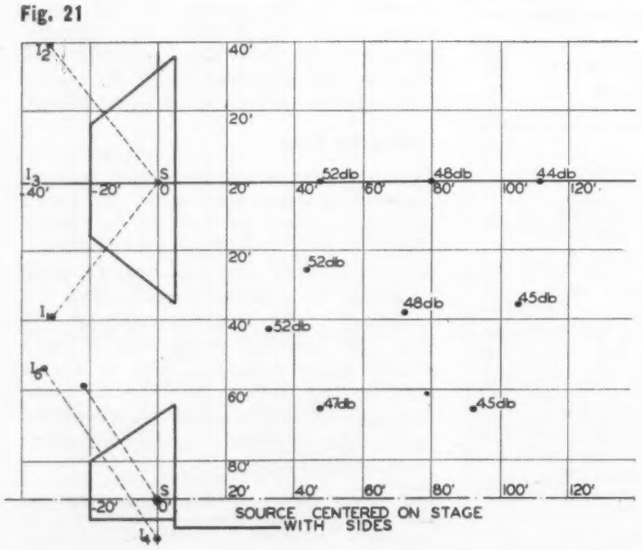
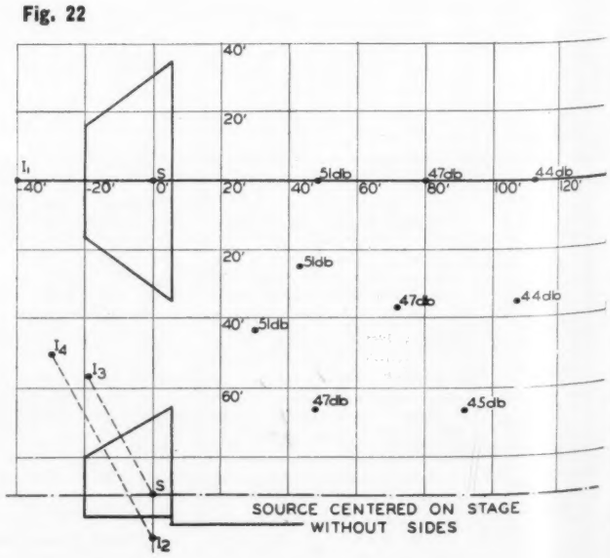


Fig. 22



vinia Park Opera Shell **(Fig. 27)** and the Sears Roebuck Pavilion at the New York World's Fair **(Fig. 28)**. The method of breaking up the ceiling into horizontal bands to adjust properly the slope in the Ravinia Shell makes it the most satisfactory of the two. The sides serve only as stage setting. The Sears Roebuck shell would have functioned more effectively had it been designed in like manner. However, since the site was extremely noisy the shell did not operate as a simple sound reflector, and a public address system had to be used at all times.

CONICAL SHELLS

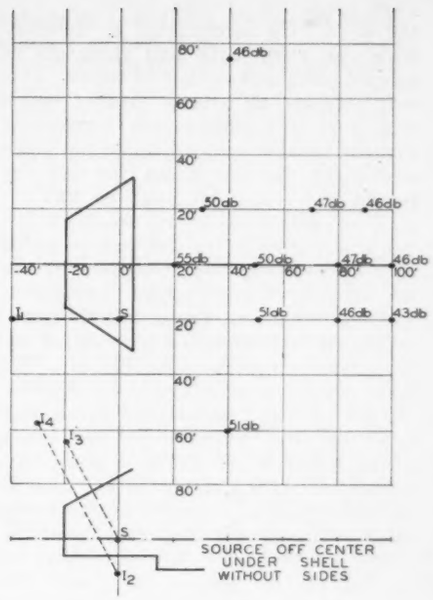
The research and study that went into the Hollywood Bowl was available for the designer of the Grandview Music Pavilion at Sioux City, Iowa **(Fig. 29)**. That research proved that a simple semi-conical shape would direct sound from the stage down the center line of the amphitheater much farther than the shell with the vertical rear wall and inclined ceiling could send it. The Peterson Memorial Pavilion in Davenport, Iowa **(Fig. 30)**, appears to be an archetype of the conical shell. The architects freely admit that acoustical information was not available at the time the building was designed. Although they apparently believed that the shape of the horn was the fundamental solution to their problem, they used it without exact knowledge of the ultimate refinement of the shape. In the completed shell, the rear wall serves the purpose of a reflector, but the side walls and ceiling are too nearly parallel to each other and to the floor to function properly.

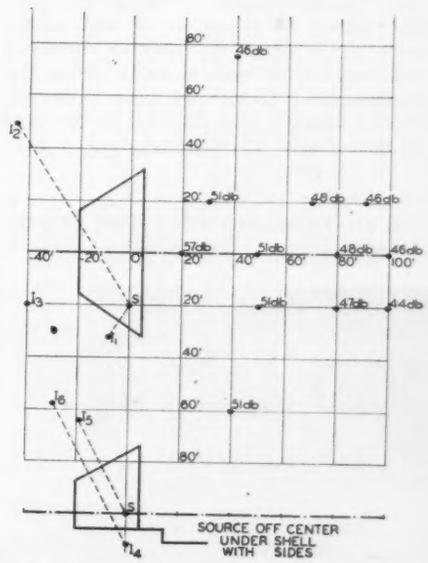
The seating area for 6,000 persons at the Grandview Pavilion is inclined at an angle of approximately 10 degrees above the horizontal, as shown on the section. The last row of seats, which is not quite 300 feet from the center of the stage, is about 35 feet above stage level. Research during development of the Hollywood Bowl indicates that when a reflecting shell of this type is used, it should be tilted forward at an angle of approximately 45 degrees if the audience is seated on the level and at the same elevation as the orchestra. An amphitheater which is inclined on a hillside and rises above the orchestra level requires the angle of the cone to be more nearly vertical than 45 degrees—actually 45 degrees plus one-half of the inclination of the amphitheater slope. This formula dictated a slope of 45 plus $\frac{10}{2}$ or 50 degrees for the angle of the cone. Professional musicians say that the harmonics of a violin are easily heard at a point well beyond the last row of seats and a stage whisper is audible at 300 feet from its source on the stage. The soffit of the great arch is horizontal in the Grandview Pavilion, but the designer could have increased the efficiency of the shell by inclining the soffit of the arch at the same angle as the remainder of the cone.

The audience area at the Fort Dodge Pavilion **(Fig. 31)** is level and accommodates 3,000 spectators. The angle of the cone is therefore set at 45 degrees and the angle is constant over the entire inclined area including the soffit of the great arch. The amphitheater is long and narrow and well adapted to this directional type of shell. The site is a secluded one in a public park. The edges are well screened by trees. Because the roads at the sides are blocked during concerts, background noise is reduced to a minimum.

TESTS ON A CONICAL SHELL

H. Lynn Bloxom, physicist of Fort Dodge, has made a series of elementary sound tests at the Fort Dodge Pavilion in an attempt to show the distribution of sound reflection and the efficiency of





Figs. 25 (center) and **26** (top)

Fig. 23

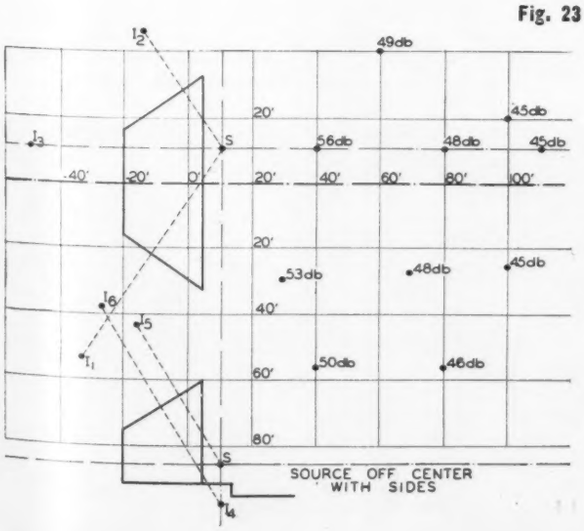
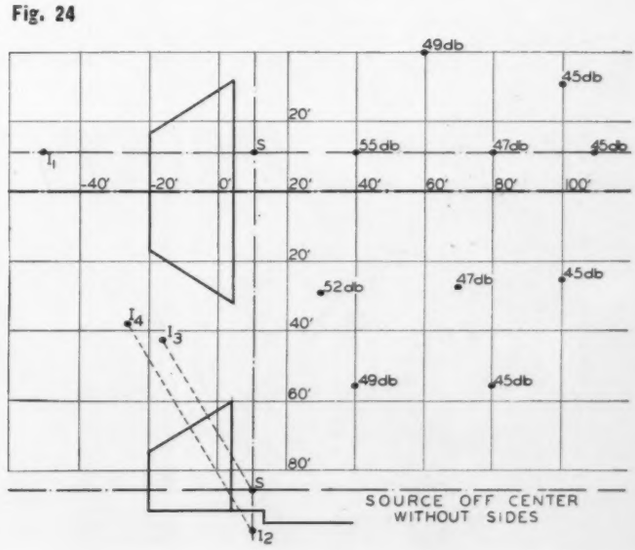


Fig. 24



the shell. He constructed a "howler" with one radio tube and rheostats to control pitch and volume of sound. This was attached to a cone speaker which had very few directional properties, and the speaker was set up on the stage under the shell at about the average height of a man. Although he was unable to attain extreme accuracy because a decibel-meter was not available Mr. Bloxom stationed listeners or observers at various points throughout the amphitheater. The observers found points at which sounds of varying intensities diminished to inaudibility. The tests developed as expected by showing the shell to have such strong directional qualities that sound could be heard about three times farther along the center axis of the amphitheater than at its outer edges. A series of tests was made at a point 600 feet from the stage. Using a note of the same pitch and intensity at two points, one inside the shell and the other outside at the edge of the pavilion, he found that at 600 feet the shell increased the intensity of the sound 36 times along the center axis. The intensity, however, dropped off rapidly at points away from the center axis. Observers were then stationed along a line parallel to the face of the shell. They found that a note which could be heard at 600 feet along the center axis could be heard only 100 feet along the base line. The test seemed to give conclusive proof of the directional qualities of the conical shell.

An interesting incident that shows the necessity for care in the design of conical shells occurred in Oklahoma City during the summer of 1939. A temporary shell of frame and pressed wood construction was being planned for the summer concerts of the Works Progress Administration Symphony. The site selected was the local high school football stadium. The shell was to be placed at the bottom of the end stadium seats, and the angle of the reflecting cone was set according to the principles just mentioned, in relation to the upward slope of the stadium seats, which were already constructed of concrete. After completion of the shell the acoustics were pronounced good. When the popularity of the concerts demanded more space for spectators, the shell was moved backward to the opposite end of the football field. It was soon noticed that music could be heard more distinctly along the top wall of the stadium seats, some 450 feet from the stage, than at the rear of the seats on the field, only 300 feet away. The directional shell designed for one condition could not be used successfully unless the slope of the shell was changed. Since making the change would mean nearly a complete rebuilding, the shell has been left as it was originally planned.

Another shell using the simple conical section is the Blatz Music Pavilion in Milwaukee (**Fig. 32**). Built as a monolith in concrete, it shows influence of the Grandview Pavilion in Sioux City, in the monumental form of the main mass and in the form of the great arch. The site, in a public park, was not chosen with care to eliminate background noise, and so a public address system has been installed.

FOR LARGER AUDIENCES

For great audiences of from ten to twenty thousand persons it is necessary to control the direction of the sound even more closely. The designer of the Hollywood Bowl (**Fig. 33**) solved this problem effectively by breaking the surface of the simple conical section into a series of concentric rings or ridges. The purpose of such a form is to place the reflecting surfaces as close as possible to the sound source. Al-

Fig. 27. Ravinia Park Opera Shell, Ravinia, Ill.

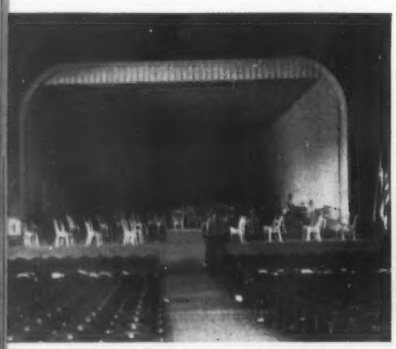


Fig. 28. Sears Roebuck Pavilion, New York World's Fair; Scott Irwin, Archt.

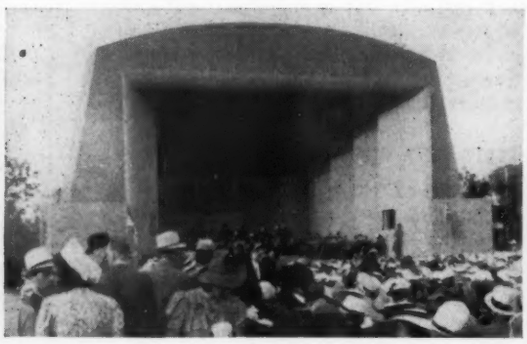


Fig. 29. Grandview Music Pavilion, Sioux City, Ia. H. L. Kamphoefner, Archt.

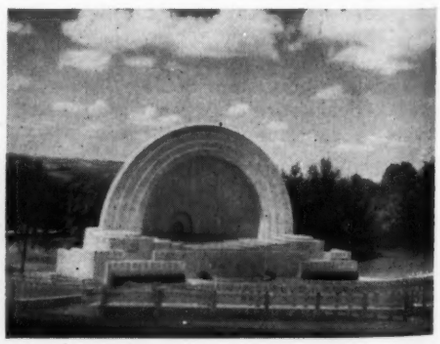


Fig. 30. Peterson Memorial Pavilion, Davenport, Ia.

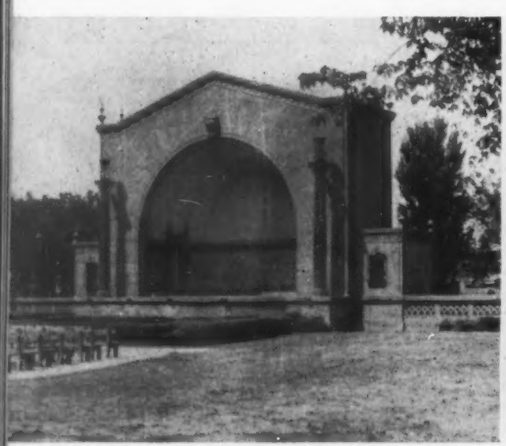


Fig. 31. Music Pavilion, Fort Dodge, Ia. Henry L. Kamphoefner, Archt.

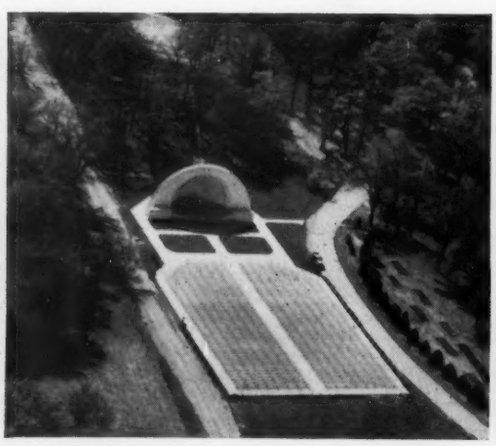
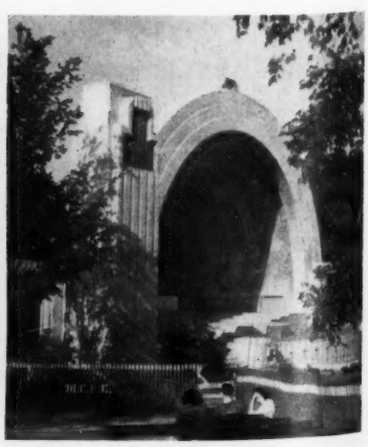


Fig. 32. Blatz Music Pavilion, Milwaukee, Wisc. Fitzburgh Scott, Archt.



though the plain conical section is simpler structurally and easier to build, its reflecting surface tends to get too far away from the sound source, especially if the slope of the amphitheater is steep and the angle of inclination of the cone is high. For orchestra and band and even for vocalists the simple conical Grandview shell seems to be adequate as a reflector for audiences of up to 8,000 persons. When reflecting surfaces are lowered and local conditions are ideal, as they are at the Hollywood Bowl, it is possible to reach audiences of up to 20,000 people.

Because of the amount of descriptive material already written on the Hollywood Bowl it would be superfluous to write in detail again of its structure and its acoustical functioning. A brief summary of its acoustical performance will suffice here. The seating area of the Bowl is inclined upward from the shell at an angle of about 12 degrees. The last row of seats is about 550 feet from the stage. Most of the sound is thrown from the shell upward to the top rows of seats. The closer rows receive plenty of sound directly from the source without need of reflection in addition. The design produces a most democratic result, since the cheaper seats at the rear of the amphitheater are in reality much better, except for detailed vision.

Several acoustical authorities have complained that the conical shell, especially this ridged type which controls the direction of sound so definitely, tends to focus high frequency vibrations down the center axis of the amphitheater whereas low frequency vibrations are spread out over the entire audience area. H. Lynn Bloxom in his tests on the Fort Dodge Pavilion intimates that this defect might exist. If it were noticeably serious it would definitely distort musical harmony and make the conical shell undesirable as a reflector. However, Vern O. Knudsen says that sound of 128 cycles and above is reflected evenly by the Hollywood Bowl and even vibrations of lower frequency are not distorted noticeably.

This type of shell, with the conical section in a series of concentric ridges, has been used at Grant Park in Chicago **(Fig. 34)** for the summer concerts of the Chicago Symphony and for very widely diversified municipal uses. Because the audience area is level the visibility of the stage is poor. The park, furthermore, is so noisy that a public address system was required. The shell, however, is sound acoustically and under better conditions would be ideal as a reflector. The Park Board evidently did not believe that the world would beat a path to the door of the

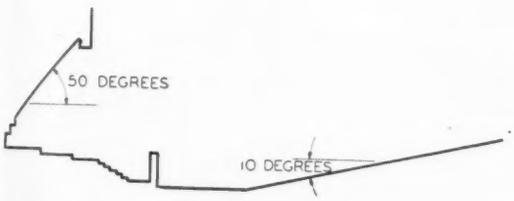
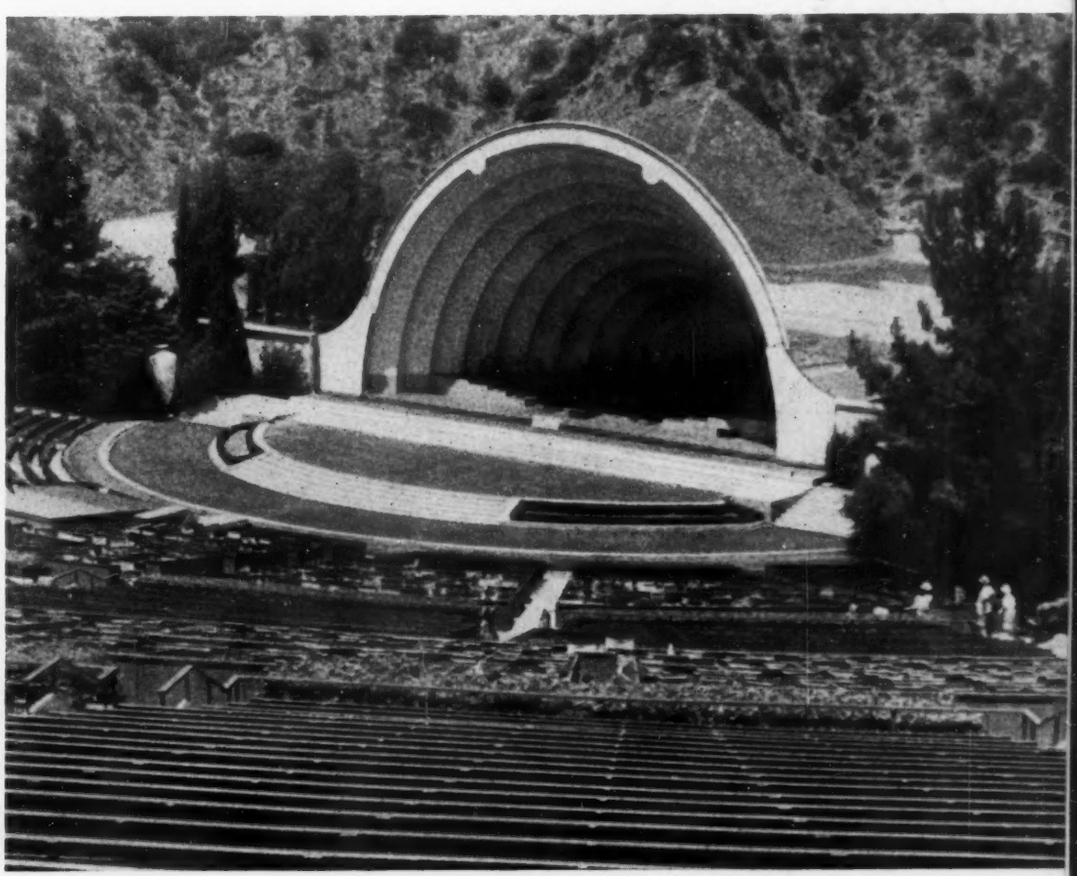


Fig. 29A. Section through Grandview Pavilion, Sioux City, Ia.

Fig. 30. Hollywood Bowl, Hollywood, Calif. Vern O. Knudsen, consultant on acoustics; Frank Lloyd Wright, Archt. Reflecting surfaces are designed for audiences of up to 20,000 people.



man who invented a perfect mousetrap, no matter where he lived. Nor did they realize that a good shell would draw listeners, wherever it was. Rather, having a good shell, they thought they must put it in a public place, where it could be seen. They should have known that a secluded site would draw a more critical audience than the poorly located shell, and probably as large a one.

The ostentatious Walbridge Park Pavilion in Toledo, Ohio (Fig. 35), built with pride by the WPA, is another shell constructed on principles used in the Hollywood Bowl. The amphitheater is secluded in a controlled section of a public park where the background noise is at a minimum, and the acoustics are good.

The Ford Music Pavilion built for the San Diego Exposition (Fig. 36) is a derivative of the conical shell. It uses a series of flat planes to accomplish the same result. This change works for a more simplified structural system and in theory directs the sound with less concentration.

Fig. 34. Grant Park Music Shell, Chicago, Ill. Designed by Chicago's South Park Board.

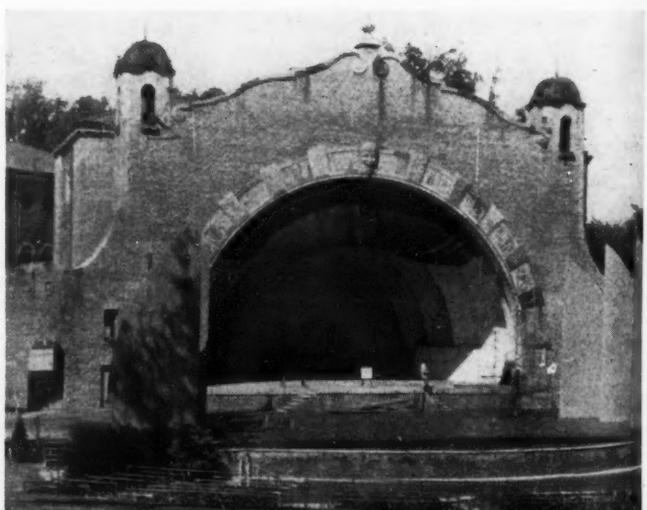


Fig. 35. Shell, Walbridge Park, Toledo, Ohio. Michael O'Shea, Archt.

GETTING RID OF ECHOES

The most interesting feature of the shell is the method the architect has used to free the acoustical system from all echo. Careless placing of such surfaces as backs of seats and retaining walls, in other amphitheaters, has produced an echo effect when the sound has been reflected from such surfaces back to the shell and then out to the audience again a fraction of a second later. Such an echo can be very bothersome. In the Ford Bowl the angles of all seat backs and retaining walls are slanted back from the vertical as shown on the accompanying diagram and the sound is reflected up into the sky as shown in Fig. 37.

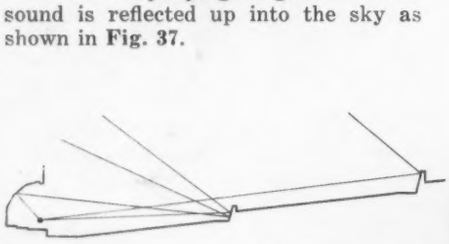


Fig. 37. Section through the Ford Music Shell and amphitheater, showing seat backs and retaining walls slanted to reduce echoes.

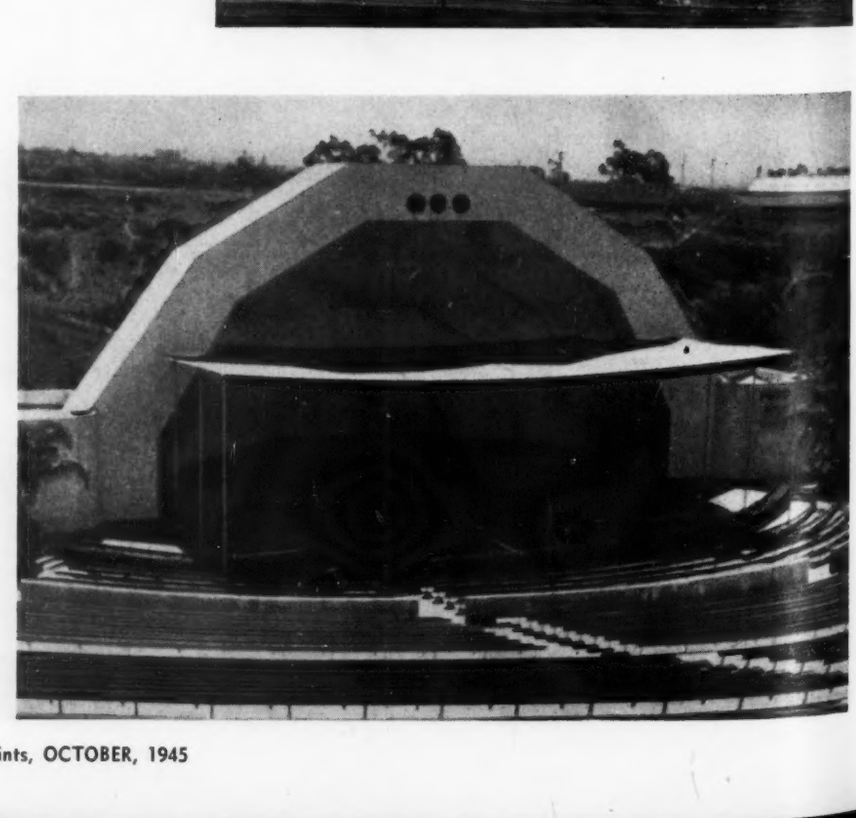


Fig. 36. Ford Music Shell, San Diego Exposition, San Diego, Calif. Richard Requa, Archt.

Peace! It's Wonderful

As this is written, American battleships have entered Tokyo Bay, American troops are on Japanese soil, gasoline rationing has ended but tires are still rationed, America has had a few days of whoopee, some people have gone back to work, while great numbers of war workers have no work to return to. There's an occasional expression of fear of a last-minute Japanese double-cross, but the general impression is that now we've got to produce for peace; to speak of our own field, that we must produce buildings and the thousands of parts which go into them.

There have been lots of replicas or slight improvements on prewar or wartime building products. There has been time for only a few brand-new developments, although there have been hints of many. In the vernacular, this is okay with us—provided those eagerly awaited new developments eventually materialize. We'll bet they will, most of them; we are keyed to miracles, Superforts, super-Superforts, atomic energy, and all the rest; and we won't remain satisfied with the imperfect products of the *laissez-faire* prewar era. On the other hand, we must not forget good prewar products just because they can't ballyhoo plexi-atomic virtues.

Reconversion—Among other pronouncements, we hear that Westinghouse is taking on many ex-servicemen in its plants; that the Square D Company, manufacturers of electrical distribution and control equipment, has virtually converted its plants to peacetime pursuits and has a tremendous backlog of orders to fill as rapidly as materials and personnel become available. There are others, too many to list even if we knew them all.

House Equipment—Extremely interesting is the emergence of a scheme for selling the consumer a "Complete House," in which most equipment formerly considered portable, and hence subject to purchasing contracts separate from the house mortgage, can be bought along with the house under a single mortgage contract. The scheme has powerful backing, including that of the National Electrical Manufacturers' Association. Coupled with it, by no means inadvertently, is promotion for the all-electric kitchen. This, of course, is no threat to progress in domestic architecture; it is an advance if it truly simplifies building problems and doesn't overburden the buyer.

There are some improved equipment items. One is announced by Edison General Electric (Hotpoint) Appliance Co., of Chicago. This is a fully automatic electric dish-washer which fits under the kitchen sink—any sink—and operates at one touch of a button, without soap, to spray, rinse, wash, and dry dishes, silverware, and even pots and pans. A sequence of eight operations automatically does everything, culminating in turning on an electrical air heater to dry the clean contents. The cabinet is fully insulated. Plumbing requirements don't differ much from conventional facilities.

Edison General Electric also announces that most of its electrical appliances should be in production by the end of September, including refrigerators, garbage disposal units, washing machines, ironers, dryers, water heaters, and kitchen cabinets; but that its automatic clothes washer and home freezer will not get into immediate production. Quantities are expected to be limited until 1946.

Nor are manufacturers of gas-operated equipment lagging. The gas industry is sponsoring a nationwide project to standardize dimensions of kitchen equipment. This is in line with current activity in dimensional coordination, if the standards chosen fit the housewives who will use the equipment, as we are told they do. Yet, according to the American Gas Association, unification of dimensions is also being pushed "so that cabinets and cabinet-sinks might be built in sizes to fit smoothly with gas ranges and refrigerators . . ."—which seems like putting the very salable cart before that horse, the consumer. Nevertheless it seems progressive.

As to unsettling news, the Crosley Corporation, of Cincinnati, Ohio, is promoting a "packaged" kitchen, in buying which, to judge by the Crosley announcement, the housewife sends them a sketch plan in which she locates doors, windows, sink, refrigerator, and range —and Crosley does the rest. To quote them verbatim: "These new packaged units eliminate the necessity for architectural drawings, for salaried or commissioned architects or contractors, for crews of workmen, and the attendant mess as well as unexpected extras." We can imagine the total lack of integration which would result in that most complex room in the house, the kitchen. We can hear the howls from outraged designers and builders.

Yes, we guess the war's over.

Plexiglas for Peace—Rohm and Haas, manufacturers of Plexiglas, transparent plastic from which plane turrets and many other war gadgets have been made, are staging a series of exhibits throughout the country. Purpose is to show how their material can be decorated (engraved, sandblasted, colored, edge-lighted, etc.) and used in many extraordinary ways, both semistructural and decorative. It is a stimulating show for the designer—not too large to comprehend, suggestive of many improvements.

STEEL BATHROOM CABINETS

Bathroom cabinets of drawn, one-piece steel construction, with rounded corners, finished in vitreous porcelain or baked enamel, are a new venture of the Grote Mfg. Co., Inc., Bellevue, Ky. Mirrors are plain or with stainless steel or chromium plated frame. There are recessed or wall surface types, as well as electrically lighted cabinets.

EXPANDING PRODUCT LINES

Modine Mfg. Co., Racine, Wis., announces a new and broader postwar line of copper blast heaters and booster units, said to be more closely adapted to needs of heating engineers and drying equipment designers. Casings are designed for vertical or horizontal duct installations, permitting use of ducts with cross-sectional areas no larger than the coil faces. A new baffle arrangement improves direct air flow through coil.

Trane Co., La Crosse, Wis., also reports a line enlargement of its propeller fans, which may now be had with 2- or 4-blade propellers—fan diameters from 15" to 48". There are 4-blade fans available in diameters from 10" to 72". Both belt and direct fans may be obtained with motor outside air stream.

VENETIAN WINDOWS

The new "Venta-Glass" window with plate glass shutters can be left open, even during a rainstorm, for draft-free ventilation. Shutters are easily operated (and cleaned), allowing 90% opening of window area; when closed, they overlap slightly, making a watertight seal. The louvers, if broken, are said to be quickly replaceable. Window screens or storm sash mounted on the outside don't interfere with shutter operation. Lyle Bishop is the inventor and Nu-Air-Wa Co., 601 S. Vermont Ave., Los Angeles 5, Calif., the manufacturer.

ONLY ONE OF ITS KIND

Wooster Products, Inc., Wooster, Ohio, announce a one-piece, all-steel, safety tread and stair step for fire escapes and stairways in industrial buildings, power and chemical plants, etc. The tread is bolted or welded to the steel stringers, and the grooved tread surface is made of non-slip, abrasive grip filler.

ADDENDUM: BPF No. 13
Air-Entraining Portland Cement

Word has been received from the Louisville Cement Co., Inc., Speed Building, Louisville, Kentucky, that they manufacture an air-entraining portland cement known as "Speed Air-Entraining Cement." They also manufacture "Speed Natural Cement," which contains air-entraining material and can be blended with standard portland cement to produce air-entrained concrete. Certain other advantages are also claimed for the natural cement. (This notice may be attached to Building Product Facts sheet No. 13, *Air-Entraining Portland Cement*, July 1945 issue.)

MATERIALS and METHODS

Accessories

1-22. *Building Accessories (Cat. 41)*, Ankortite Products, Inc. Reviewed September.

Adhesives

1-23. *Miracle Adhesives and Plastic Coatings*, 4-p. illus. folder on uses of cold-bond, fast-setting adhesives for: tile-setting; bath and washroom fixtures; glass, glass blocks, and mirrors; hanger supports and insulation hangers; acoustical tile, wallboards, cork, glass insulations, etc. Data on anti-slip plastic coatings for floors, decks, stairways, etc. Miracle Adhesives Corp.

1-24. *Technical Data on Pliobond Adhesive.* United States Plywood Corp. Reviewed September.

1-25. *The World of Tomorrow Will be Welded by a Paint Brush (Bulletin 1800)*, U. S. Stoneware Co. Reviewed September.

Air Cleaners

1-27. *The Magic of Electronics in Air Filtration (Form 255)*, 16 pp., illus. bulletin. Simple, clear explanation of theory and practice of electronics in air filtration; research and development on electronic air filters by the AAF; advantages and applications to industrial and commercial air cleaning problems. American Air Filter Co., Inc.

Air Conditioning

1-26. *Introducing the Air-Vane Line, AIA File 30-E*, Rock Island Register Co. Reviewed September.

Concrete

3-39. *Haydite Building Units, AIA File 10a2*, American Aggregate Co. Reviewed September.

3-42. 4-p. illus. folder on advantages of "Featherweight" concrete precast roof slabs for fireproof, insulated roof construction. Detail drawings. Federal Cement Tile Co.

3-41. *Fireproofing Structural Steel with Zonolite Water Repellent Concrete*, illus. folder (6x9) on isolating structural steel, also wood, with a monolithic lightweight, insulating concrete coating to make it fire-resistant. Comparison table on dead-load reductions of "Zonolite" concrete; recommended mixes. Universal Zonolite Insulation Co.

Conduit

3-37. *Orangeburg Fibre Conduit*, Fibre Conduit Co. Reviewed September.

3-40. *Therm-O-Tile (Bulletin 451)*, H. W. Porter & Co., Inc. Reviewed September.

Doors and Door Equipment

4-28. *Your Own Private Doorman*, Horton Mfg. Div., The Aviation Corp. Reviewed September.

4-29. *Wartime Catalog No. 22W-2*, Norton Door Closer Co. Reviewed September.

4-30. *Rezo Flush Doors, AIA File 19-E-12*, portfolio of data, illustrations, and construction detail drawings on lightweight wood flush door, with interlocking grid core providing air and sound conditioning, strength, rigidity, under extreme temperatures and atmospheric conditions. Paine Lumber Co., Ltd.

Electrical Wiring and Equipment

5-19. *Condensed Catalog 451*, Bull Dog Electric Products Co. Reviewed Sept.

5-20. *Multi-Breaker Service and Load Centers (Cir. 323)*, 4-p. illus. folder on 5 types of circuit breakers, surface or flush mounted. Construction details, box numbers, outside box dimensions, data on knockouts, suggested specifications. The Trumbull Electric Mfg. Co.

Elevators

5-16. *Sedgwick Standard Specifications for Elevators and Dumb Waiters (1002)*, Sedgwick Machine Works. Reviewed Sept.

Fabrics

6-30. *Thortel Fireproof Fabrics*, Thortel Fireproof Fabrics. Reviewed Sept.

Finishes

6-41. *Hydrated Lime for Plaster*, 8-p. illus. folder on white, fibered, base coat hydrated lime for plaster finishing. How to prepare, use; specifications. The Finishing Lime Association of Ohio.

Fireplaces, Garbage Disposal Equipment

6-27. *Donley Devices*, Donley Bros. Co. Reviewed September.

Floors—Coverings and Maintenance

Armstrong Cork Co.'s "Ideas" portfolios on store modernization: **6-33** (food); **6-34** (beauty); **6-35** (drugs); **6-36** (restaurants); **6-37** (shops); **6-38** (shoes); **6-39** (men's apparel); **6-40** (markets). Reviewed September.

6-31. *Goodyear Static-Conductive and Spark-Resistant Rubber Flooring for Munitions Plants.* Goodyear Tire & Rubber Co., Inc., Chemical Products Division, Builders Supply & Flooring Dept. Reviewed September.

Glass Block

7-28. *Daylight with Insulux*, Owens-Illinois Glass Co. Reviewed September.

7-29. *Excellent for Dairies*, Owens-Illinois Glass Co. Reviewed September.

Granite

7-31. *Standard Granite Sections, AIA-8-B-3*, H. S. Fletcher Co. Reviewed Sept.

Gypsum and Gypsum Products

7-32. *Sound-Absorbing Gypsum Plaster, AIA 39-B*, 4-p. illus. folder on advantages of gypsum acoustical plaster as a noise-conditioner. Gypsum Association.

Hardware

8-54. *Finishing Hardware at a Glance (17b/1)*, 18-p. illus. postwar catalog supplement on designs and specifications of finishing hardware—locks, latches, casement and sash, transoms, cupboards and drawers, door pulls and stops, kick plates, push bars and plates, coat hooks, door closers. Charts for each type of building. Lockwood Hardware Mfg. Co.

Heating and Heating Equipment

8-55. *Aerofin Standardized Heating Surface, AIA File 30c4 (Bulletin H-39-1)*, 58 pp., illus. Technical data on "Aerofin" air heating units for pressures from 1-200, 2½-200, and 25-350-lb. gauges, and for vertical or horizontal air flow. Air friction, velocity, face area, temperature and condensation, temperature rise constants tables, temperature effects charts, piping and other diagrams. Aerofin Corp.

8-57. *Vacuum Return Units (Bulletin 100-A) AIA File 30C5*, 4-p. illus. bulletin on vibrationless pumping equipment for selective pressure- and temperature-controlled vacuum return heating systems. Specifications, standard and super ratings. Ames Hydrovac Corp.

8-58. *Town of Tomorrow (SA-3356)*, 42-p. bound brochure. Review of present-day American architectural styles of homes to which gas heating is adaptable. Interior and exterior photos, floor plans, basement designs, insulation methods. Data on space-saving gas heater and air conditioning units. Bryant Heater Co.

8-61. *Engineering Standards for the Use of Contractors, Engineers, Architects, Salesmen (1942 ed.)*, 72 pp., illus. (4x7⅝). Data, tables, discussions on heating system design, from heat loss calculation to standardized duct fittings. Layouts, detail drawings, charts. Gar Wood Industries, Inc.

8-63. *Hoffman Hot Water Controlled Heat*, 7-p. illus. booklet on a hot water controlled heating system applicable to any size home, for split systems, for panel heating, to zoning, by means of forced, continuous circulation. Drawings, operation diagrams, piping layout. Hoffman Specialty Co.

8-52. *Blast Heaters, Booster Units (Cat. 345)*, Modine Mfg. Co. Reviewed September.

8-55. *Choosing A Heating Plant Wisely*, 16-pp. illus. booklet (3¾x8½). Advising prospective home builders and modernizers to get expert advice for installing a heating plant. Merits of hot water, steam and vapor, and warm air heating systems; choice of fuel, boilers; automatic heating equipment: domestic water heating; radiators and convectors; radiant heating; air conditioning. Plumbing and Heating Industries Bureau.

8-64. *Bulletin B-3000*, 6 pp., illus. Technical data on compact steel heating boilers for use with all fuels and all types of firing—equipped with ample-sized combustion chambers for maximum heat generation, and flue doors with gas-tight joints. Titusville Iron Works Co.

Insulation

9-35. Consumer folder on aluminum foil insulation, Alfol Insulation Co., Inc. Reviewed September.

9-36. *Industrial Insulations*, 28-p. illus. catalog on high and low temperature mineral wool insulations—"Mono-Block," blanket, pipe covering, cement, felt, "Koldboard," fill, etc. Thermal conductivity charts, specifications, sizes. Baldwin-Hill Co.

Kitchen Equipment

11-03. *Portfolio of Personalized Kitchen Plans*, 25 pp. Kitchen plans for all types of housing, prepared by the Hotpoint Kitchen Planning Div. of Edi-

son General Elec. Appliance Co., Inc. Sketches, designers' suggestions for lighting, electrical appliance placements, color, windows, ventilation, cabinets, sinks, etc.

11-04. *Kitchen Beauty Styled by Lyon*, 4-p. bulletin. Detail drawings of metal sectional kitchen cabinets—wall, base, sink units, linoleum sink tops, sectional work tops, accessories. 6 types of floor plans. Lyon Metal Products, Inc.

Lighting and Lighting Equipment

12-32. *Postwar Lighting for the Medium Home (Y-477)*, General Electric Co., Lamp Dept. Reviewed September.

12-33. *Hospital Lighting Data Book (Cat. 41), AIA F31-F-2 & 31-F-28*, 35 pp., illus. Catalog on modern hospital lighting units—fluorescent, diffused, shielded, indirect, incandescent—for all sections of a modern hospital, from major and minor surgery rooms to entrance and exit signs. Sizes, wattages. Edwin F. Guth Co.

12-34. *Lighting Drafting Rooms*, from the publication, *Architexts*. Discussion of correct lighting for drafting rooms; converging vision; eyesight correction; amount of light; table slope; wall, floor, and ceiling finish; relief areas; choice of lighting system. Holophane Co., Inc.

12-37. *Seeability for Tomorrow*, 30-p. illus. booklet on "a few interpretations of modern thinking applied to lighting design" for homes, stores, restaurants, offices, factories, schools. Westinghouse Electric & Mfg. Co., Lamp Division.

Marble

13-11. *Marble in the Home*, 8-p. illus. booklet. Uses of marble in entrances, bathrooms, kitchens, on staircases, floors, fireplaces, thresholds, table tops, shelves, etc. Vermont Marble Co.

Paint

16-52. *Red Lead for Structural Work*, 6-p. illus. reprint of article by L. L. Carrick. Discussion of red lead as a protective coat for structural steel. Specification chart. Lead Industries Assn.

16-53. *Pittsburgh Color Dynamics for Offices, Hotels, and Restaurants*, Pittsburgh Plate Glass Co. Reviewed September.

Partitions

16-61. *Fairhurst Unitfold Partitions, Disappearing Door Wardrobes, AIA-19-E-61, AIA-28-B-33*, 12 pp., illus. booklet on folding wood partitions made in separate, single, and interchangeable units for all building types, and for space-saving wardrobe doors—metal or wood. Suggested arrangements, installation data, specifications. International Steel Co.

Piping

16-59. *Acid-Proof Pipe and Fittings (Bulletin 550)*, 12-p. illus. booklet on ceramic pipe, acid-, alkali-, and corrosion-proof, for drain lines, ventilating ducts, etc. Chemical analysis; physical properties; engineering, technical, and installation data; information on caulking compounds and cement-asbestos pipe. U. S. Stoneware Co.

Plumbing and Plumbing Equipment

16-55. *Architects' Views on Flush Valve Applications (Form 477)*, Imperial Brass Mfg. Co. Reviewed September.

16-56. *Architects' Views on Flush Valve Applications (Form 477)*, Imperial Brass Mfg. Co. Reviewed September.

16-60. *Grease Interception, Manual AIA File 29c4*, 16 pp. Information on proper selection and installation of grease interceptors. Selection chart and formula; installation diagrams; detail drawings; dimensional data. Josam Mfg. Co.

16-57. *What You Should Know About Plumbing*, 16-p. illus. booklet (3¾ x 8½). Advising prospective home builders and modernizers to employ a master plumber; planning bath and powder room; choice of bathroom equipment; lighting; kitchen and laundry room planning; hot water heating; plumbing for the home built beyond water main facilities; Plumbing and Heating Industries Bureau.

Pumps

16-58. *Facts You Should Know About Centrifugal Pumps and Impellers*, 20-p. illus. booklet on advantages and disadvantages of general purpose centrifugal pumps (all makes)—"the unbiased opinions of Deming Engineers". . . . Suggested as a textbook. Drawings, diagrams. The Deming Co.

Roofing

18-14. *Long Span Roof Arches*, 4-p. illus. bulletin, Arch Roof Construction Co., Inc. Reviewed September.

18-15. Two consumer pamphlets on precast concrete roof slabs, Federal Cement Tile Co. Reviewed September.

Steel

19-35. *Airtherm Steel Deck for Roofs, Walls, Partitions*, 4-p. illus. bulletin on use of lightweight pressed steel, open-ribbed deck for factories, mills, garages, etc.—applicable to flat or sloping roofs. Airtherm Mfg. Co.

19-36. *Laclede Steel for Construction*, Laclede Steel Co. Reviewed September.

Toilet Equipment—Marble

20-19. *Marble Toilet Units, AIA File 22-A-3*. Two 4-p. illus. folders and detail sheets on 4 types of marble toilet stall units for single and multiple unit installations. Installation instructions, specification. Vermont Marble Co.

Trim

20-18. *Marble Trim, AIA File 8-B-1*, Vermont Marble Co. Reviewed Sept.

Ventilation

22-10. *Computing C.F.M. for Heat Removal (Bulletin D1-45)*, American Machine and Metals, Inc., DeBothezat Fans Division. Reviewed September.

Walls and Wall Finishes

23-36. *Masterwalls by Hauserman (Cat. 45)*, E. F. Hauserman Co. Reviewed September.

Water Heaters

23-42. *Catalog TW95d, AIA File 29D2*, 4-p. illus. catalog on all-weld "Tabasco" hot water heater for extra heavy service: 5 sizes with hourly ratings 165 to 700 gals. of water heated 50° per hour. Specifications, dimensions, drawings. Kewanee Boiler Corp.

Windows

23-43. *Bayley Windows-Doors-Operators in New Modular Sizes, AIA File 16-a*, 31-p. illus. catalog. Data, modular layouts approved by Metal Window Institute and conforming to A-62 of the A.S.A.; construction detail drawings on many types of metal windows and operators, on industrial steel doors. Information on mastic surrounds (for windows set in concrete, on finishes, glazing of "Thermopane," etc.). The William Bayley Co.

23-38. *Book of Windows for Public Buildings*, 20-p. illus. booklet presenting a window-manufacturer's ideas on public building design. Mesker Brothers.

23-29. *Collection of Pella Window Ideas for Home Builders (Form 126)*, Rolscreen Co. Reviewed September.

Wood and Wood Preservatives

23-40. *Today's Idea House*, Ponderosa Pine Woodwork. Reviewed September.

23-41. *New Jobs in Our Town*, 20-p. illus. booklet on using wood for timber truss construction. Photographs of various wood structures. Data on termite protection; discussion on safety of timber. Timber Engineering Co.

Pencil Points, 330 West 42nd St., New York 18, N. Y.
I should like a copy of each piece of Manufacturers' Literature listed.
We request students to send their inquiries directly to the manufacturers.

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NAME POSITION

FIRM

MAILING ADDRESS ☐ HOME ☐ BUSINESS

CITY STATE

PLEASE PRINT 10/45

from the Technical Press

Building Trades Blueprint Reading, *By J. Ralph Dalzell, 233 pp., illus., paper cover, spiral bound. American Tech. Soc., Chicago 1945. Part I, Fundamentals; Part II, Specifications, Blueprints, Examinations.*

"The first aim of this book is to teach architectural blueprint reading without requiring that students burden themselves with other principles not closely associated with the building industry or with the skills, knowledge, and techniques needed to make an architectural drawing."

This is clearly achieved by straightforward explanations well supported by profuse, easily read illustrations.

Part I commences with a study of the shapes of surfaces and solids and calculations for areas, cubage, and dimensions. Progressing through representation, symbols, conventions, the text concludes with consideration of structural details.

Part II presents the specifications and blueprints for 3 buildings which include typical construction details such as carpenters, masons, and other craftsmen ordinarily encounter.

Throughout Parts I and II, each section is followed by a complete set of questions requiring close study of the text and teaching the student to read blueprints as well as giving him many practical projects to do.

The book is admirably adapted to use either for short term classes in blueprint reading or as a supplement to classes in architectural drawing, design, and estimating.

British Building Studies

Post War Building Studies, Ministry of Public Works. His Majesty's Stationery Office, London, 1944. (Available from the British Information Services, 30 Rockefeller Plaza, N. Y. C.)

No. 4. Plumbing. *The Plumbing Committee of the Building Research Board of the Department of Scientific and Industrial Research. 43 pp., illustrated, appendices, bibliography, glossary. 30 cents*

Recommendations for British postwar plumbing practices resulting from a survey of existing scientific information and practice. This report, with an eye to postwar demands, concentrates on plumbing for low-cost housing. The considerable variation between British and American practice lessens its value in this country.

No. 6. Gas Installations. *Committee convened by the Institution of Gas Engineers. 42 pp., tables, appendices, index, glossary. 15 cents*

No. 7. Steel Structures. *Committee convened by the Institution of Civil Engineers. 8 pp. 15 cents*

A review of the practice of steel frame construction, this booklet makes recommendations for revision of present British standards to ensure the greatest practicable economy of material and rapidity of construction. The recommendations, minor in character, encourage design closer to the true stresses in structures with greater confidence in materials. Welded construction receives hearty support in the form of advice that the utmost use be made of shop- and field-welding, that special encouragement be given the development of new types of design made possible by welding.

No. 8. Reinforced Concrete Structures. *Committee convened by the Institution of Structural Engineers. 12 pp. 15 cents*

The Committee suggests that the greatest rapidity of construction and economy of material could be achieved through the preparation of a New Code of Practice and the improvement of methods of design and construction. Principal recommendations for the new code are increase of 10% in allowable compression stress for concrete, the guarded use of pre-stressed concrete, the welding of mild steel reinforcement, and the consideration of composite construction. For improvement in design, it is suggested that design of reinforced concrete be restricted to persons properly qualified. Construction is to be improved by employing only experienced contractors and by considering operations such as mixing and laying concrete, steel bending and placing, and the erection of formwork as trades, to be recognized as such by the trade unions.

No. 9. Mechanical Installations. *Committee Convened by the Institution of Mechanical Engineers. 120 pp., illus. 60 cents*

The Institution of Mechanical Engineers, worried by the lack of understanding between their profession and builders, makes many suggestions which should be conducive to better relations in the postwar world. Their opinions fall under three main headings: Preparation of Projects, Execution of Works, and Operation and Maintenance of Installation. Criticisms fall impartially on engineers, contractors, architects, and government agencies responsible for codes. It would seem that the Proposed Codes of Practice, as they apply to mechanical installations, would eliminate many of the irritants.

This pamphlet, more than others reviewed to date (with the possible exception of School Construction), is broader and more helpful to simplification and unification of the building industry.

FROM OTHER PUBLICATIONS

Recommended Practice of Home Lighting. *June 1945* Illuminating Engineering, *publ. by Illuminating Engineering Society, 51 Madison Ave., New York, N. Y. Paper bound, tables, illus. $1.00*

"The ability to see clearly and quickly with least strain on eyesight, energy and general well being depends upon the quantity and quality of lighting. The lighting of the home must be coordinated with architectural detail and decorative schemes to blend inconspicuously with them and give them added emphasis and interest at night."

Upon this theme the article assembles authoritative information designed to enable architects, home owners, and builders to design interior lighting systems which provide for the seeing needs of the average family. Lighting systems are divided into 5 types (from direct to indirect lighting) and recommended illumination values for specified visual tasks are presented in tabular form. This information is integrated to suggest specific lighting fixture types and wattages for major rooms and activities. The suggested fixtures are illustrated by sketches (which seem unnecessarily reminiscent of ornaments of the gaslight era) and approved lighting arrangements are demonstrated in photographs of contemporary rooms.

MANUALS

Pump Engineering Data. *Economy Pumps Inc., Hamilton, Ohio, 1945. Cloth bound, illus., tables, index, 416 pp.*

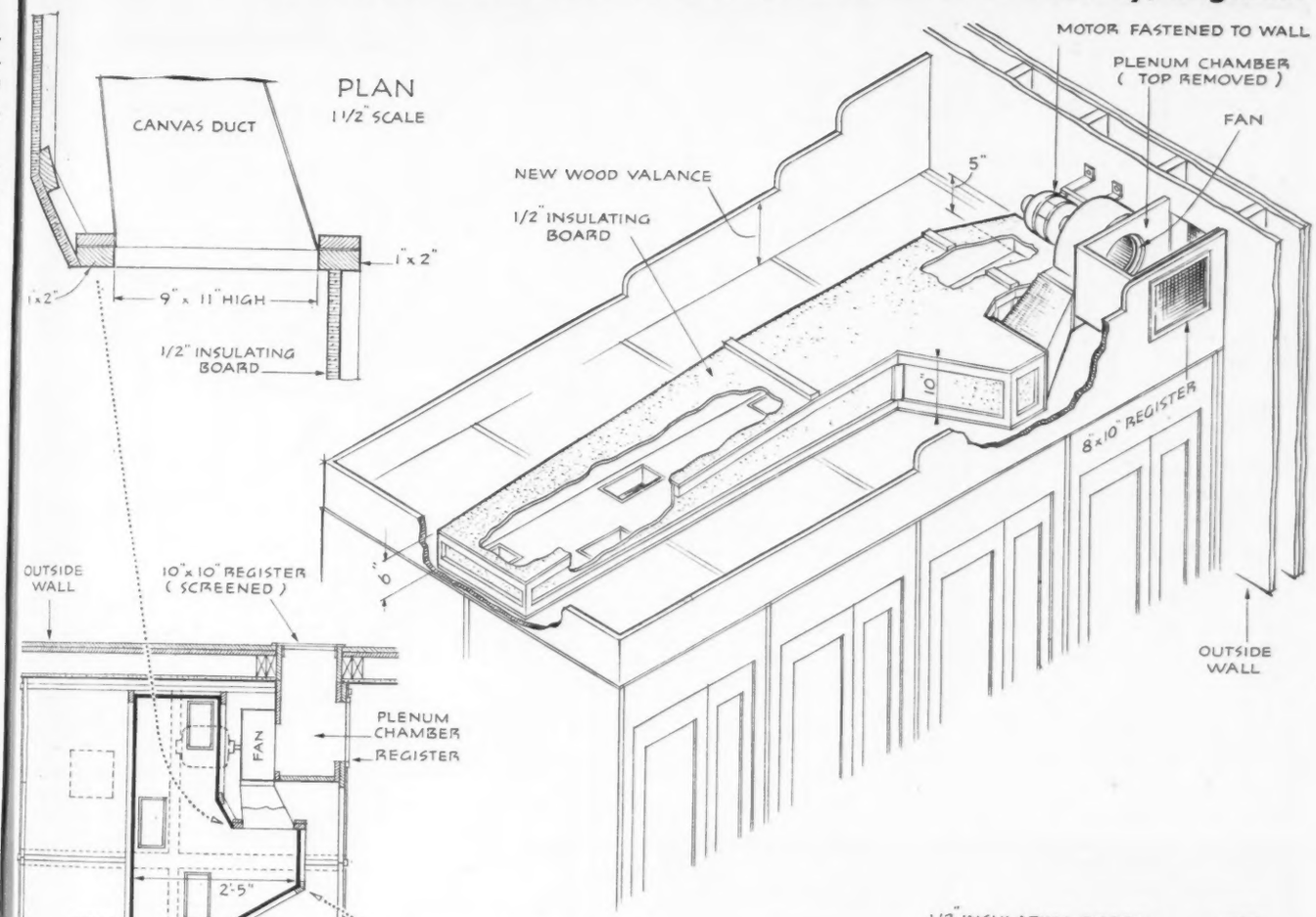
Pump Engineering Data is a sales catalogue of Economy Pumps Inc., expanded to form a handbook of pump installation design. The principles of pump engineering are explained generally and technically with the aid of formulas, tables, and charts. A comprehensive chapter of pertinent engineering data supplements use as a handbook.

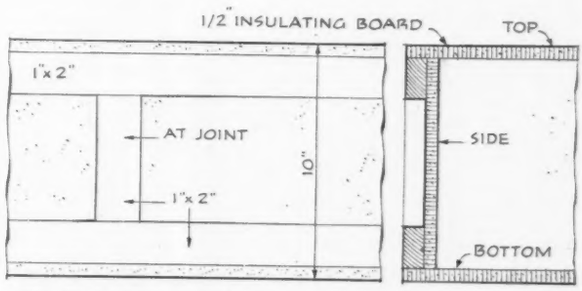
Byers Wrought Iron for Radiant Heating, A. M. Byers Co., Pittsburgh, Pa. *Paper bound, 52 pp., illus., charts, tables.*

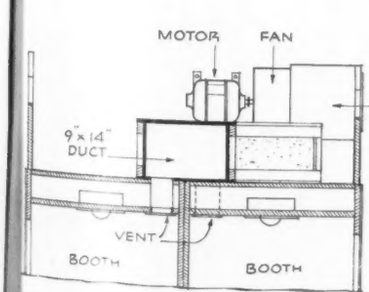
Designed as a working manual for architects and engineers, this pamphlet presents accumulated installation data and engineering information. Although it does not present an exhaustive discussion of technical theory, the booklet does detail procedure for the design and installation of coils and the calculation and selection of required piping and heating. Advantages and comparative costs are analyzed and the theory of radiant heating is briefly presented.

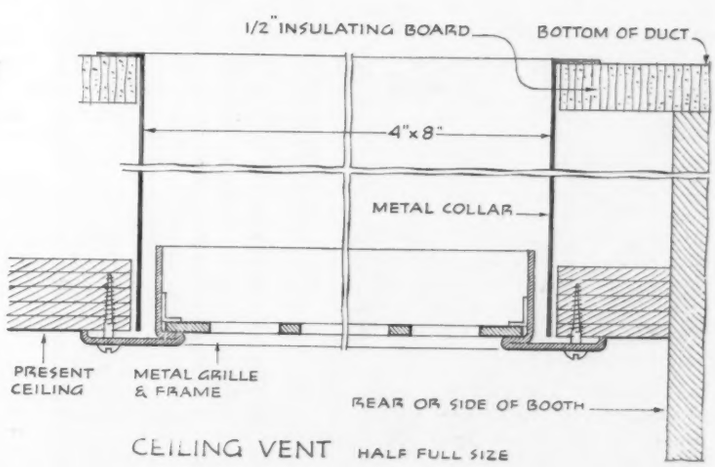
The doubts of prospective users are answered in a section of very satisfactory replies to the most frequently asked questions. Many dubious points of control, maintenance, and effects are cleared up.

TELEPHONE BOOTH VENTILATION — F. D. Jockley, Engineer

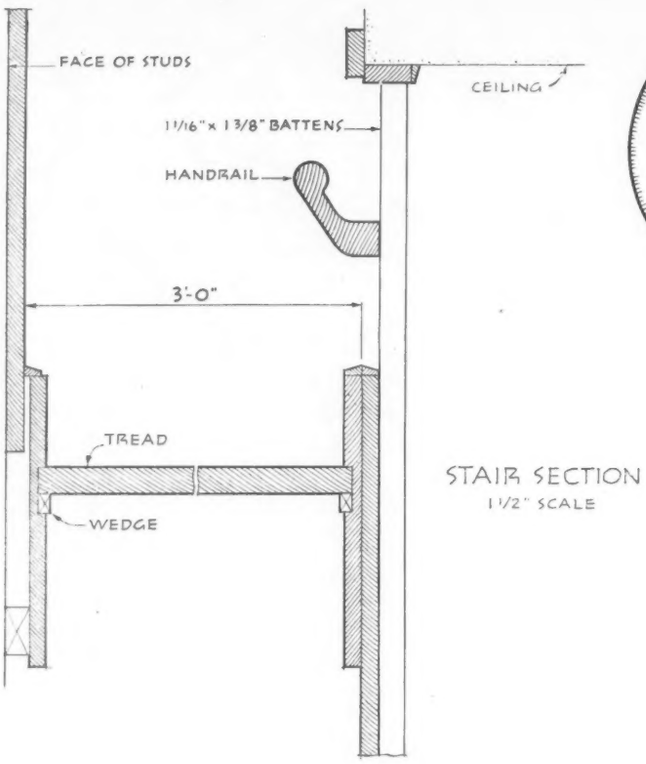




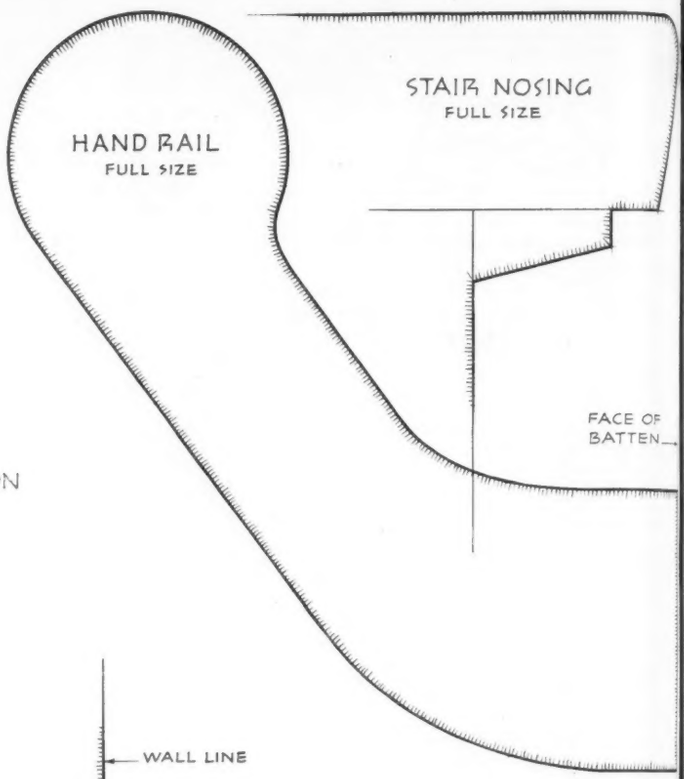


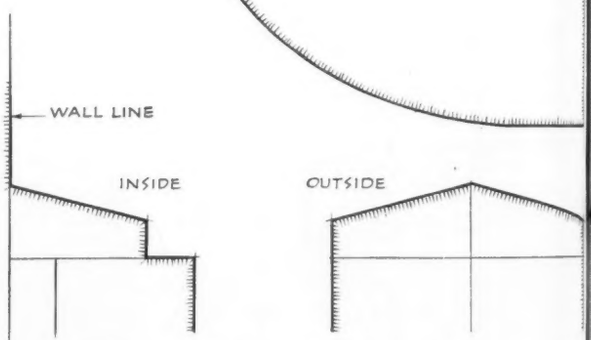


DETAILS: STAIR — Rudolph Mock, Architect



STAIR SECTION
1 1/2" SCALE





STAIR STRINGER CAPS FULL SIZE

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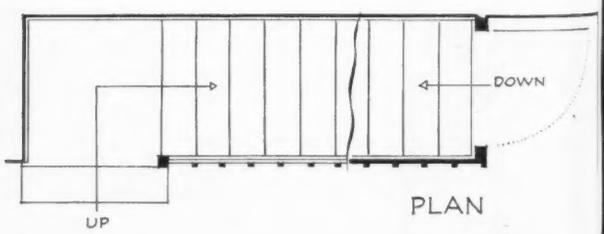
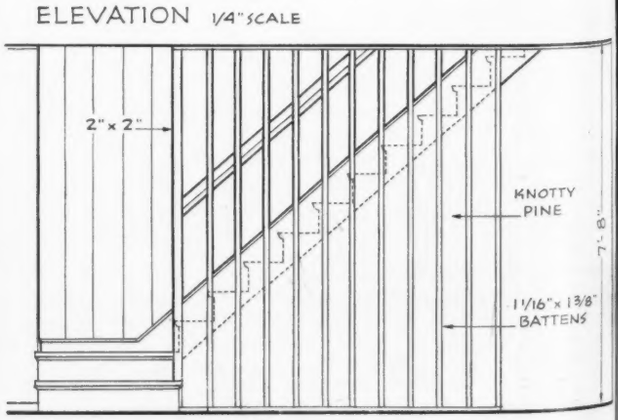


PLAN

ELEVATION 1/4" SCALE



Cold Cathode Lighting Cont'd.

boards, due to wartime difficulties in obtaining reflectors. In any case, thorough compliance with electrical and safety codes is highly desirable. The use of high voltages should never be overlooked, and its effects on insurance rates must be determined.

USES—As intimated, cold cathode lighting has definite advantages for certain purposes. It provides a "line," rather than a "point," source of light, which can be used bare if the installation is properly designed to avoid brightness contrast. The medium offers the designer great latitude, in that the light sources can be straight, curved, bent, made three-dimensional, etc.; display and space-lighting can be combined; a wide range of colors is available; little heat is produced by the light source; a line of light can be used, as in a store, to attract or direct traffic. Where "dimmers" are to be used, cold cathode can be employed; where there is vibration; where wiring has to be extremely simple; where long, uninterrupted service is of great importance—in all these cases cold cathode should be considered.

Special applications include such cases as: Use in localities in which the atmosphere contains corrosive acid vapor (with transformers located outside the affected area); use for stair lighting, for instance, concealed behind a handrail; use in showcases, show-windows, etc.; and many others.

PROPERTIES AFFECTING DESIGN OF COLD CATHODE LIGHTING

Variables	Choice	
	Large	**Small**
Tube Diameter (for a given current value)	Higher efficiency Lower brightness Longer useful life More footage per transformer Greater structural strength; fewer supports	Higher light output per foot Smaller space requirement More easily bent Less footage for given illumination
	High	**Low**
Tube Current (for a given diameter) and **Current Density** (Ma/Sqmm. for any diameter)	Higher light output per foot Less footage for given illumination value More footage per transformer	Higher efficiency Longer useful life Lower brightness
	Long	**Short**
Length of Tube Section	Higher efficiency Fewer electrode housings and wiring connections	Easier to handle, pack, ship, and store Simpler to install and maintain
	High	**Low**
Transformer Rated Voltage	Higher efficiency More footage per transformer Less wiring	Lower noise level Less rigorous insulating demands Smaller bulk — less obtrusive, if exposed

COST—Against the advantages of cold cathode lighting must be balanced its (heretofore) high installation cost, and a cost in terms of usable light delivered per unit of current consumed that, according to many engineers, has been high. Other engineers believe this light-for-current cost to be entirely reasonable, and it is probable that the new low-voltage fixtures will reduce both these types of cost. On the other side of the picture, again, is low lamp-replacement cost due to long life and infrequent burn-outs.

Other factors enter the cost picture. Method of sale, for instance, may prove advantageous; there have been cold cathode sales on a **lease** rather than a **sale** basis, with the fixtures leased to the buyer of the service, and maintenance, lamp replacement, etc., covered in the same contract. In this case, the consumer buys light and lighting service, not current and equipment. Another factor: standardization of tubing sizes and lengths, fixtures, equipment, and installation practice, may reduce costs substantially. Both independent manufacturers and trade associations are proceeding in this direction. For example, the low-voltage cold cathode fixtures now coming into the market are all nominally eight feet long, with tubes 7 ft. 9 in. long.

LIGHTING DESIGN—The general approach is through the total light output required for a particular application to maintain the specified illumination value in service. An appropriate compromise is then made between high output per foot, high surface brightness, convenience in handling, shortened useful life, and moderated initial cost as against lower output per foot, higher efficiency, more feet and pounds of glass, lower brightness, longer sustained output, higher initial cost, and reduced replacement expense. One decides whether, under the given conditions, a smaller number of the highest-voltage and more efficient transformers are to be preferred to a greater number of lower voltage rating, less bulky, more quiet in operation and with less rigorous insulating demands. The relative cost of tubing and transformers, of labor and electricity will enter into the determination of the greatest over-all economy.

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Articles in "Illuminating Engineering" (magazine)

—"Cold Cathode Fluorescent At War," by John C. Sabatini. April 1943.

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—"Application of High-Voltage Fluorescent Tubing to Lighting Problems," by D. P. Caverly. December 1941.

—"Some Engineering Aspects of Lighting from Cold-Cathode Fluorescent Sources," by H. J. Chanon and A. C. Barr. December 1942.

—"Fluorescent Sources at Work," by R. D. Bradley and F. B. Lee. January 1944.

SOURCES OF SUPPLY—Cold cathode lighting installations may be purchased from many contractors and manufacturers. Not all can be included here. Omission of any source does not imply lack of merit in either producer or product.

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FEDERAL ELECTRIC COMPANY, INC., 8700 So. State Street, Chicago, Ill.
GENERAL ELECTRIC COMPANY, Lamp Department, Nela Park, Cleveland, Ohio.
GENERAL ELECTRIC COMPANY, Specialty Transformer Division, Ft. Wayne, Ind.
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SYLVANIA ELECTRIC PRODUCTS COMPANY, Danvers, Mass.; New York, N. Y.
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VOLTARC TUBES, INC., 21 Beech Street, Newark, N. J.
WHEELER INSULATED WIRE COMPANY, Bridgeport, Conn.

COLD CATHODE LIGHTING

GENERAL DESCRIPTION—Cold cathode is a form of fluorescent lighting, and requires alternating current. It is called "cold" because the electrodes which are an essential part of all fluorescent lamps are not preheated, as they are in a more familiar type of fluorescent lamp. It possesses certain other advantages, and like all equipment, some disadvantages. There are certain uses for which it is obviously better suited than other types of lighting, and some to which it cannot, or should not, be put.

ELECTRICAL CHARACTERISTICS—In any fluorescent lamp, light is produced by an electrical discharge which activates the **phosphors** with which the inside of the lamp is coated. The phosphors translate the invisible ultraviolet radiations of the discharge into visible light. Use of different phosphors and different gases (which are compressed within the lamp tube) produces different colors of light.

The discharge, or arc, may be "struck" in two ways: by passing a relatively low voltage through a coiled wire filament, the cathode, which is coated to increase its capacity to emit electrons and preheated electrically to facilitate its starting; or by passing a relatively high voltage through a sturdier cathode, usually cup-shaped and ferrous, which is sometimes coated but requires no preheating. The surge of high voltage takes the place of heat. Wire cannot be used for this type of cathode because it would eventually disintegrate. In "hot" cathode lamps the cathode attains a temperature of from 900C to 1000C; in "cold" cathode, approximately 150C.

Cold cathode lamps will operate when there is considerable fluctuation of line voltage, although they will not produce their rated amounts of light at other than the specified voltage. They require no starters, start instantly when the electrical circuit is completed, and their length life is unaffected by repeated or frequent starts. They do require transformers to change line voltage (primary) from that usually available (110, 115, or 120) to that required for the lamp (secondary; 2000 to 12000 volts for high-voltage cold cathode; 600 to 700 volts for low-voltage cold cathode). Transformers are becoming available for line voltages of 230 or 460V for installations where this type of current is available.

LOW-VOLTAGE COLD CATHODE—Recently introduced, this type of cold cathode lighting requires the 600 or 700 volts noted above for starting; thereafter, lamps operate on 430 to 460 volts. This greatly reduces the hazard of electrical shock, wiring precautions, etc., required for the higher voltage type.

PHYSICAL CHARACTERISTICS—Tubing used for all types of cold cathode has to be relatively small in diameter and relatively long to assure proper operation. Typical diameters are as follows, with standard sizes (which are also those which operate most efficiently at specified lengths) shown in bold type:

SIZES OF COLD CATHODE TUBING

8 mm.	11 mm.	15 mm.	22 mm.
9 mm.	**12 mm.**	18 mm.	**25 mm.**
10 mm.	13 mm.	**20 mm.**	

Standard sizes are cheaper; non-standard sizes are ordinarily available on special order only.

Tubing has to be rigidly secured to its terminals, which means that lamps are not replaceable except by a qualified person. This may be no disadvantage because the lamps have extremely long life. They are ordinarily rated at 10,000 to 12,000 hours of burning, and some manufacturers guarantee them for a year. They have been kept in use for much longer periods, although such a practice is not advisable unless close check is kept on the amount of illumination produced, particularly if the seeing task involved is at all critical.

The sturdy construction of the lamps, housings, etc., and their extreme mechanical simplicity, make them highly resistant to vibration. Low temperatures do not impair the light output, making cold cathode lighting available for outdoor uses in cold climates and for cold indoor spaces, particularly those in which the colors available offer advantages.

The transformers required are heavier and bulkier than the equipment needed for other lighting media. Much effort has recently been spent in redesigning transformer housings, etc., in order to minimize these difficulties. Transformers can be located remotely from the lamps if conditions require; and one circuit may be broken into groups each served by a smaller transformer, or one transformer may serve a series which is grounded at the mid-point and in effect becomes two series of lamps. Depending upon transformer location, secondary (high-voltage) wiring may be almost eliminated by using the lamps themselves to carry the current, in series wiring; and a minimum number of primary electric outlets may be needed. For the low-voltage installations which are now becoming possible, two-lamp transformers are available.

COLORS—Several colors are available. They are obtained by using different gases in lamps coated with various phosphors. Certain colors have been developed for brilliance, for such uses as outdoor displays, etc., where quality and color-effect are less important than attention-getting characteristics; these, naturally, are not suited for interior uses. Other colors have been developed specifically for indoor purposes, are less brilliant, may be combined to produce warm, cool, or various color-toned effects, or to aid precise color-grading of merchandise, etc. In the following list are shown typical colors. Manufacturers' names for these colors vary, and some are currently available in limited quantities only. Precise color information cannot be given here; the reader will have to obtain it from his supplier.

TYPICAL COLORS OF COLD CATHODE LIGHTING

White	Amber Gold	Daylight
3500° white	Yellow Gold	
Soft white		Blue
Cream white	Green	
Warm white	Deep Green	Ruby Rose

Gases used to obtain these colors are, commonly, neon and mercury vapor. The light output of neon tubing remains substantially constant until failure, which occurs only when the neon is exhausted. It cannot be used to produce white light, and it has lower light-producing efficiency. Fluorescent mercury tubing does depreciate in lumen output, the rate of depreciation varying with the amount of current for a given tube diameter, that is, with current density. The advice of lighting engineers is strongly recommended, not only on this point, but also on all phases of design with this lighting medium.

QUALITY OF LIGHT—Cold cathode lighting produces slightly fewer lumens per watt than fluorescent, and can distribute them over a greater length of tubing. If well distributed, in tubing of not too small a diameter, shadowless, glare-free lighting will result; brilliance of color and intensity of light (measured in foot-candles per sq. in. of tubing surface) have also to be taken into account. It is just as poor lighting practice to employ cold cathode lighting which has too great a brightness contrast as it is so to employ any other kind of lighting. Shields and diffusing media can be employed with cold cathode, although these may increase cost of installation. In general, lighting intensity at the source is greater with tubes of minimum diameter due to the concentration of light; and less with tubes of larger diameter.

INSTALLATION—Cold cathode tubing may be installed as a "custom" job, individually formed and fitted to design requirements or job conditions; or the newer low-voltage fixtures, each an independent unit, with or without reflector, containing two, four, or more lamps, may be used. Tubing can be fastened directly to the ceiling or wall, in which case the ceiling (wall) surface becomes the reflector and brightness contrast may be reduced. If this is done, care must be taken to ascertain that the structure is sound, as sagging, cracking, or undue flexure might break the rigidly supported tubes. Tubing has also been installed on flat, white-painted

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Reviews

EDUCATION FOR PLANNING

By Davidson-Smull

President Truman is calling for more TVA's, housing, slum clearance. There is a good likelihood that much of the governmental program will be initiated, but there is not as strong a likelihood that the planning profession has the proper personnel for the job. The phase of planning upon which the country is embarking requires collective, rather than individual, effort. Architects, attorneys, economists, engineers, and sociologists will have to coordinate their endeavors. TVA indicates the results of such collaboration; more recently, the first prize team in the Boston contest proved that only a "team" has sufficient composite ability to attempt all the answers.

To date, we have placed too much emphasis on turning out the master or super-planner, presumably endowed by nature and a weighty education with all possible abilities. Rather, one should aim at training a "piece" of a planner. True, we need planning administrators with over-all perspectives. But essentially the day's work will be done by specialists who have tasted the planning philosophy.

Just as the typical collegiate program includes a basic course in American government or elementary economics, a course on the principles, history, and significance of planning should be offered. It should be broad enough to attract students of social science, technical and natural science majors desiring the "planning approach" in addition to their special fields of interest. Furthermore, it should be possible for these students to have really advanced work in planning—in land economics, the history of the city, housing problems—without necessarily being required to take degrees in planning.

As for the curriculum designed to provide an academic degree in planning, it should have sufficient flexibility to encourage the non-technical student, and all possible facilities of the university should be made available for purposes of research, etc.

Harvard's Graduate School of Design probably offers the most comprehensive curriculum for professional training of all American schools. The announcement of studies (*Courses in City and Regional Planning*, Department of Regional Planning, Graduate School of Design, Harvard University, Cambridge, Massachusetts, 1945) reveals that four planning degrees are offered: the Bachelor of City Planning, the Master of City Planning, the Master of Regional Planning, and the Doctor of Regional Planning. Unfortunately the significant distinction between the city planning and regional planning degrees is obscure, and both programs place too great an emphasis on municipal as against broader regional problems.

The stress placed on social science training as a prerequisite for certain of these degrees is encouraging. This interest in more than just the physical aspects is further indicated in the intellectual breadth of Harvard's newly formed Council on Regional Planning. Members of the university's Government, Economics, Sociology, and Geography Departments are represented along with the faculty of the School of Design.

A more specialized solution of the professional educational problem was attempted by the Carnegie Institute of Technology in conjunction with the Pittsburgh A.I.A. *The Report on Community Planning and Integration in Allegheny County* (Demonstration Course in Community Planning, Carnegie Institute of Technology, Pittsburgh, 1944; 26 pp., diagrams and charts) was the outgrowth of a series of evening lectures and exercises for technicians.

(Continued on page 118)

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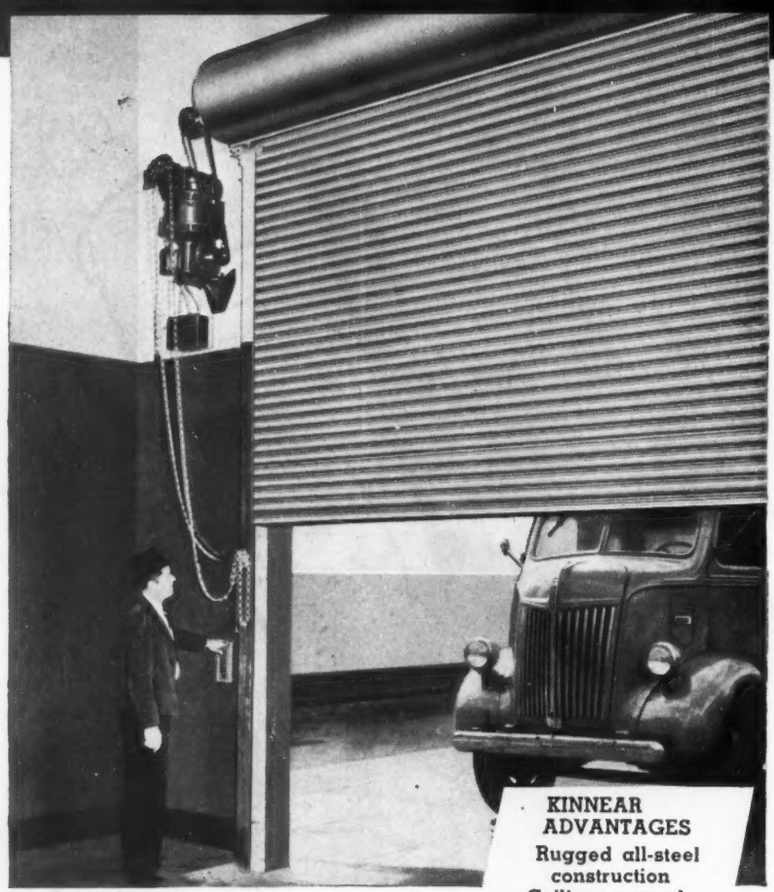

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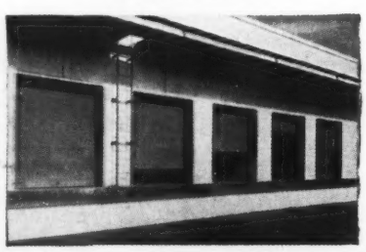

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Reviews

(Continued from page 116)

The course objective was to achieve familiarity with general aspects and tools of planning as well as the solution of a specific community's problems. Lectures by authorities from the profession and private industry, drafting room studies, and field work were the medium. The "students" were from governmental agencies and business, the majority being architects. Based upon the premise that "the architect's skills are uniquely oriented to make him useful in planning," this training session aimed at providing him with a broader knowledge of his environment. This type of training program should stimulate similar courses elsewhere.

There is need for education below the professional level. For, once a community has generated sufficient public spirit for creating a master plan, it must be equipped to do the job. Too often it is not. Enthusiasm for planning may wane precipitously at this stage if the know-how is lacking.

To prevent this lapse, a means by which sufficient personnel can be trained for the job and a standard procedure of operations are requisite. If there is a dearth of trained staff members, public participation equipped with more willingness than facts will suffer in effectiveness. Enlightened citizens must still do the spadework for a master plan in most communities of America. To maximize this lay effort, civic leaders must learn what their job is and how to do it.

The New York Regional Plan Association has revised its booklet, *Planning Your Community* (A Manual of Suggestions for Practical Community Planning, by E. C. Morrow, N.Y.R.P.A., 205 East 42nd Street, New York 17; 42 pp., 50 cents) which is intended to facilitate local planning. It does not (and rightly) enable municipal officials or citizens to attempt technical planning without experienced professional assistance. It indicates why planning is needed and how it should be organized, and points up the solutions of many planning problems.

A more technical approach is that of the Rhode Island State Planning Board *(Manual of Post-war Planning for Cities and Towns in Rhode Island,* compiled by the Committee for the Advancement of Local Planning of the State Planning Board, 1405 Industrial Trust Building, Providence 2, R. I., 1944; 40 pp.). This is a guide to the organization and operations of local central planning authorities in that state. A system of standing committees, each representing a phase of planning (public works, housing, zoning, and land use, employment, and so on), is proposed and a check list for each committee presented.

(Continued on page 120)

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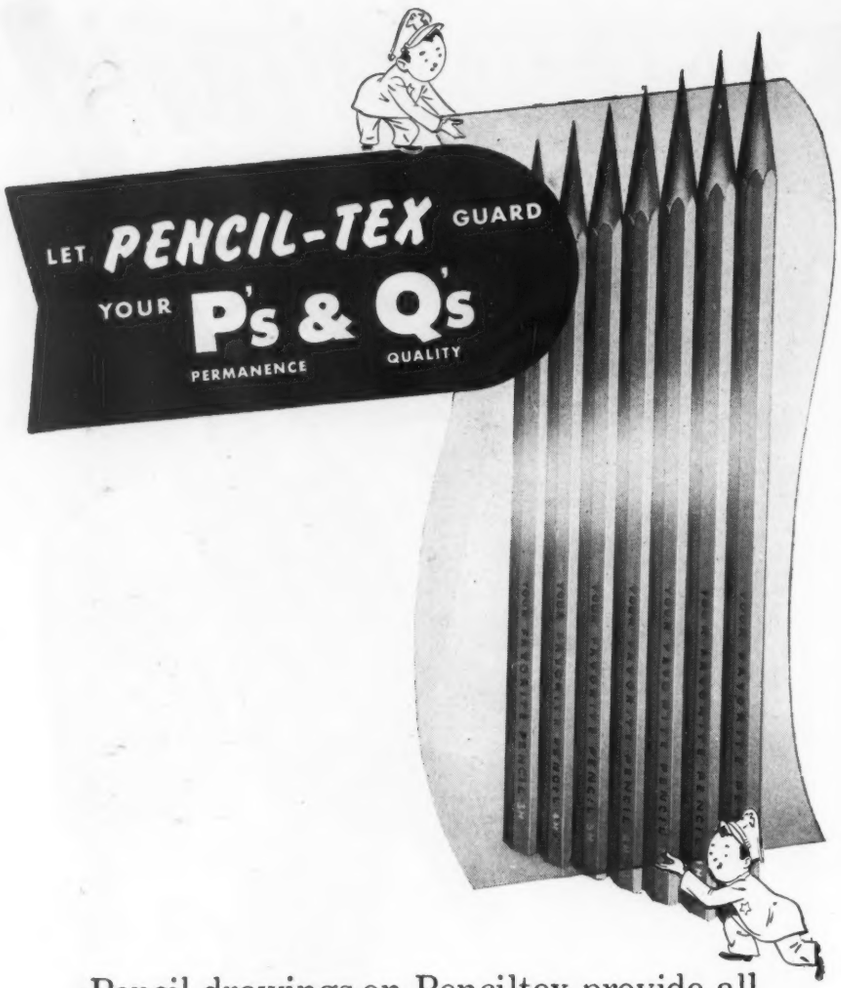

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POST

Reviews

(Continued from page 118)

The Rhode Island proposals are suited to areas where resources do not permit the hiring of professional personnel. Jurisdictions with a greater spending power should consider the committee method a supplement to, not a substitute for, full-time planning personnel.

These two approaches are good; experts must be trained and the public educated. There is need for other media whereby citizen interest can be encouraged and directed. Courses in community planning at the adult education level will produce some enlightenment. But it is at the level where citizenship is actually created—in our public schools— that the greatest need and opportunity exist. Our youngsters are taught community civics, geography, history, and government almost universally. However, they have not learned to view their city and region as living organisms, to be familiar with their resources, their possibilities. In England, school children have made housing studies and aided in mapping for city planning purposes. Few communities in this country have used their juvenile resources similarly.

A good deal of the routine work for a planning board—much of which is never even done on restricted budgets—could be the duty of carefully supervised children. They might collect primary statistics of the door-to-door type, or make traffic counts. Even if their work has little immediate utility for the agency its educational value is great. Be assured, youngsters who have analyzed their community's resources, who have visited its slums, will be less content, when adults, to squander these resources or live in hovels.

FROM AN ART TO A SCIENCE

Cost Measurement in Urban Redevelopment, by Miles Colean and Arthur P. Davis. National Committee on Housing, 512 Fifth Avenue, New York 18, 1945. $15.00

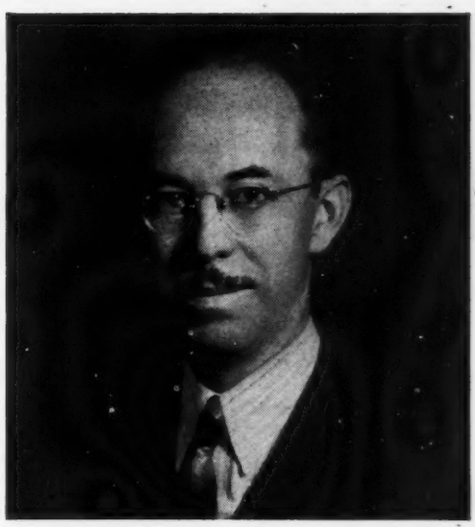
Why a Stuyvesant Town? The density is great, the height oppressive, and the rents far from moderate. The project has, and with justice, been scored on these accounts. Yet alternate economic means of redeveloping apparently do not exist. Metropolitan Life has scientifically selected a road which under present land and building costs seems the only way.

As city planning moves from an art to a science, the answer to this, among other problems, becomes more obvious. It is easier to cant against the existing

(Continued on page 122)

IN THIS ENGINEER'S PLANS FOR POST-WAR HEATING...

Petro "Long-term economy" receives important consideration.



William H. Dusenbury is a prominent New York engineer, a member of the firm of W. H. & J. F. Dusenbury, who have been consulting engineers for many millions of dollars worth of building over the country. He has acted as consulting engineer on many hospital projects including the Alice Hyde Memorial Hospital in Malone, New York; the Rosary Hill Cancer Hospital in Hawthorne, New York; the Yonkers Health Center and Clinic in Yonkers, New York; and the Brooklyn Hebrew and Israel-Zion Hospitals, both in Brooklyn. Among other recent work he has done are the Bethlehem-Fairfield Shipyards in Baltimore, and the Sears, Roebuck and Company Building in Arlington, Virginia.

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PERFORMANCE of any heating system is measured in terms of economy—not only in fuel but in maintenance and repair over a long period of time. Based on his personal supervision of numerous Petro Systems, Mr. Dusenbury made these comments a year ago in these pages:

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Reviews

(Continued from page 120)

order; to change it in a practical fashion requires factual information and statistical procedure which until very recently have been lacking.

The study of cost measurements by the Committee on Housing is, in fact, a tabular slide rule for urban redevelopers. It provides a "means of measuring," in respect to certain specific types and quantities of dwelling structure, the effects of variations in land costs, financing costs, and taxes. "Thus, given a land cost of 25 cents, 50 cents, one dollar, or any other figure per square foot, and assuming specific rates for taxes and over-all financial charges, the report indicates what results are to be expected when the site is redeveloped with (1) single detached houses, (2) row houses, or (3) three-, six-, or twelve story multi-family houses. Through different combinations of the variables (using tables) it is possible to estimate with a high degree of accuracy the rents that must be obtained; the extent to which, in a given type of building, rising land costs may be mitigated by reductions in taxes or financial charges; the point at which it is necessary to shift to a higher density type of building in order to maintain a given rent; and many other essential answers, the lack of which has hampered redevelopment."

The volume includes the plans on which these tables were based as well as equations for adjusting the tabular results according to various construction or operating costs and land coverage. The value of these carefully prepared tables and formulas will grow, of course, with use. Some conclusion is obvious at first glance: land cost certainly is the fly in the ointment. When the square foot cost rises to 75 cents, a twelve-story building is the only economic solution.

Projects of the two-story garden variety are sheer dreams for the central city, and even six-story apartment houses are uneconomic in much of the urban core. The result is either the pull of undue concentration in the center or the push of decentralization to the periphery. Apparently the pull is weaker than the push.

The study confirms, factually, the trend city planners have long decried. But the planners have not faced the significance of this push and pull. They have either blueprinted garden communities past the city limits or they have proposed fanciful rebuilding of present congested areas in a manner unrelated to land costs. These tables on cost determination do not dissolve the redevelopment paradox; they point the finger at the difficulty. We may follow Metropolitan Life's Mr. Ecker along the road to economic return through congestion, we may build in outlying areas which drain the urban life blood, or we may (and in fact have to) solve land costs. The profession must shift some of its imaginative effort from civic designs in the sky to municipal finance on the ground.

The value of this report for encouraging original ideas in redevelopment is too great to limit its circulation merely to those who will profit immediately from its tables. The present high price will make developers the main readers and we hope this information will become generally available in a reprint.

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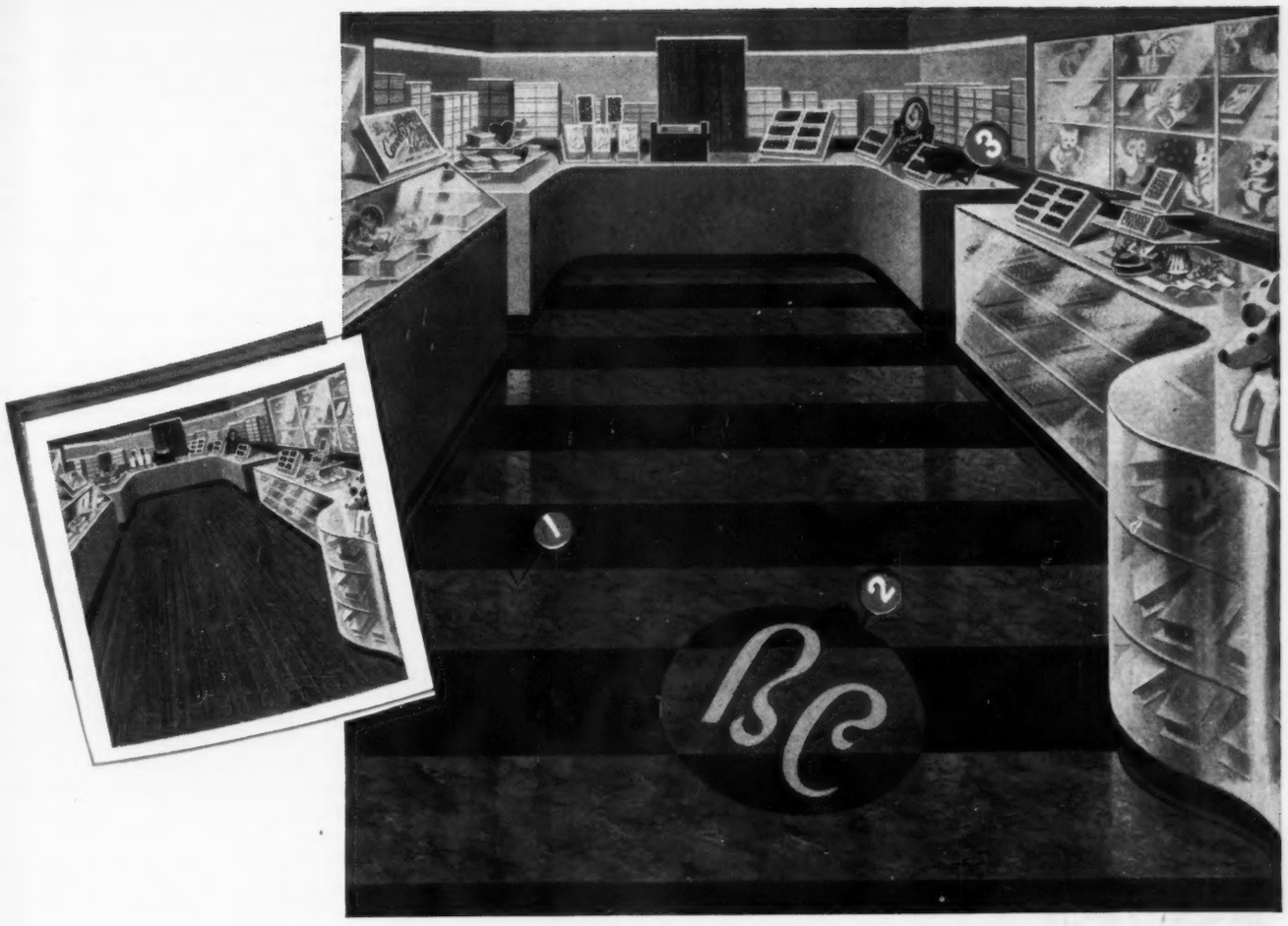
BUYING MADE EASIER

Contemporary Shops in the United States. By Emrich Nicholson. Architectural Book Publishing Company, Inc., 112 West 46th Street, New York 19, 1945. 192 pp., illustrated. $10.00

The progress which has been made in this country during the past decade in retail store design has long been worthy of a book. Mr. Nicholson has developed such a book, and it is properly a col-

(Continued on page 124)



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ARMSTRONG'S LINOLEUM

ARMSTRONG'S LINOWALL • ARMSTRONG'S RESILIENT TILE FLOORS

Reviews

(Continued from page 122)

lection of photographs with a minimum of text.

Thumbing its pages, one finds, in the main, that our architects and designers have clearly kept paramount the problems attached to selling goods at retail, and have thus evolved store plans that strive to facilitate merchandising activities. In other words, "form follows function" here to a much greater degree than can be said of a good deal of our other industrial designing. Hence, the book throws light on the fact that acceptance of modern design has moved faster in commercial work than it has in products for the home, for example, except in appliances and bathroom fittings, of course.

A few general characteristics about the current tendencies in store design emerge from the photographs in this book.

Designers are striving more than ever to make the merchandise accessible, to remove artificial barriers, to make buying inviting and simple. Open showcases, the absence of clutter, easy self-service, are implicit in much of the current work. A predilection for the "open front" in which the whole store becomes a window is frequently present. This finds expression in the extensive use of glass doors and through the absence of window backgrounds. The free-flowing showcase, serpentine or U-shaped, established itself as one of the more important developments of recent years, inasmuch as it often permits more merchandise to be shown and offers a greater feeling of privacy to suit shoppers.

Versatility is to be seen in such diverse expressions as a fanciful pink-and-white bird cage setting for a candy shop, contrasted with the forthright masculinity of a wood-paneled sporting goods shop.

If one wishes to carp, one can say Mr. Nicholson has devoted a surprising amount of space to the work of some architects and designers, and relatively little to that of others. (We suppose a book of photographs such as this is always vulnerable to someone's criticism of misplaced emphasis.) The book is top-heavy with New York work. Most of the captions lack facts about the materials and color schemes employed. Despite this, the book fills an important need and will doubtless enjoy brisk sale.

To Europeans who have little knowledge of American accomplishments in store design, the book should provide a stir and, we think, much applause.

A special word of commendation should be added for the foreword by George Nelson. It is authoritative, provocative, and long ranged, particularly in the vista it opens up of community planning of stores integrated into an over-all plan, bringing with it elimination of the highly individualized solutions that make Main Street such a heterogeneous mass today.

ALFRED AUERBACH

FOR BACKWARD-LOOKERS

A Handbook of Ornament. By Franz Sales Meyer. Wilson & Follett Co., 1255 So. Wabash Ave., Chicago 5, Ill., 1945. 3,000 illus. $2.50

This is a republication, a poor reprinting from worn plates, of a former classic. It was originally published in Germany prior to 1888 and in a complete English edition in 1892. Books of this type (it has 3,000 illustrations) were indispensable during the eclectic period of the nineteenth and early twentieth century. Then architects were confectioners happily applying pretty icings to their questionable creations. In this book they could find griffin and centaur, olpe and convolvulus, partizan and fauchard, trapezophoron and rhyton. Or-

(Continued on page 126)

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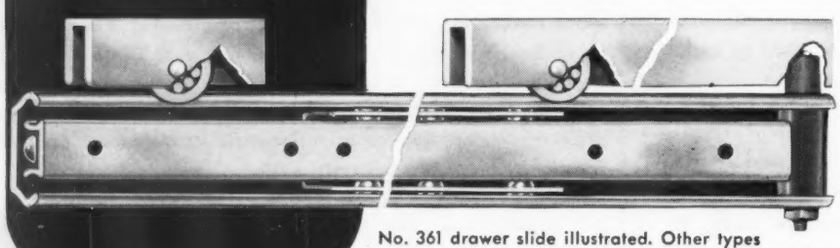

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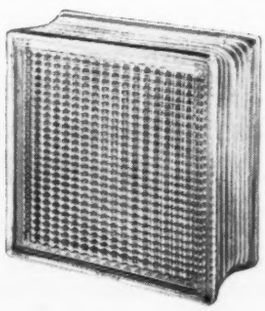

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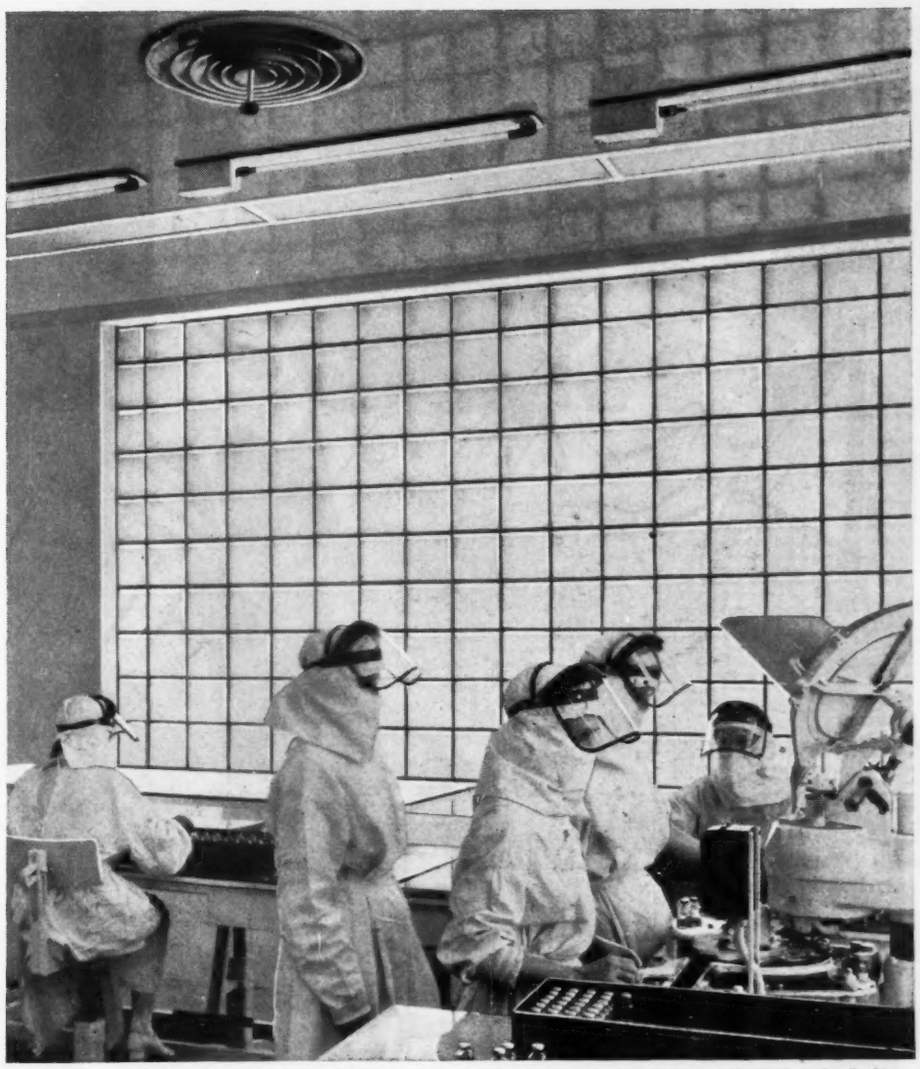

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Reviews

(Continued from page 124)

naments of all periods—Egyptian, Byzantine, Romanesque, etc.—were theirs for the copying.

Only the historian or designer of period stage settings will find the book of any practical use.

LAWRENCE E. MAWN

Periodicals

Reviewed by Maude Kemper Riley

THE ARCHITECTS' JOURNAL
45 The Avenue, Cheam, Surrey, England

May 3, 1945

Belfast, in Northern Ireland, sprang up during the industrial revolution in the haphazard way such fast-growing centers do, without adequate regard for industry and housing. A half-million of Northern Ireland's 1¼ millions (the country is the size of Yorkshire) live in the capital. Under a Planning Advisory Board and the Planning Commission, a study has been made of the needs of the people and the resources of the country. The resulting Plan for Belfast may "make planning history," according to the *Architects' Journal,* which gives the plan a large space in this issue.

The planning machinery, originated by W. R. Davidge, has been running under the guidance of "a team of young officers of the Ministry of Health and Local Government headed by the chief architect, Denis Winston." To relieve over-population, light industries will be moved to seven small towns eight miles from the city center and workers will be enticed to follow. Belfast has 40 dwellings per acre—yet 9,000 married couples are without homes and 5,000 houses are pronounced unfit for human habitation. Within the city, four-story flats and two-story houses will be erected to re-house two-thirds of the present population.

A plan to coordinate transport by road, rail, sea, and air is daring but said to pay in the long run: a new by-pass to the South; extension of others; a system of ring roads which will keep heavy traffic out of the center or business-shopping district. Boldest move is a general re-doing of the river front (the River Lagan runs through the city). Planners will move downstream coal wharves, cross-channel steamer berths,

(Continued on page 128)

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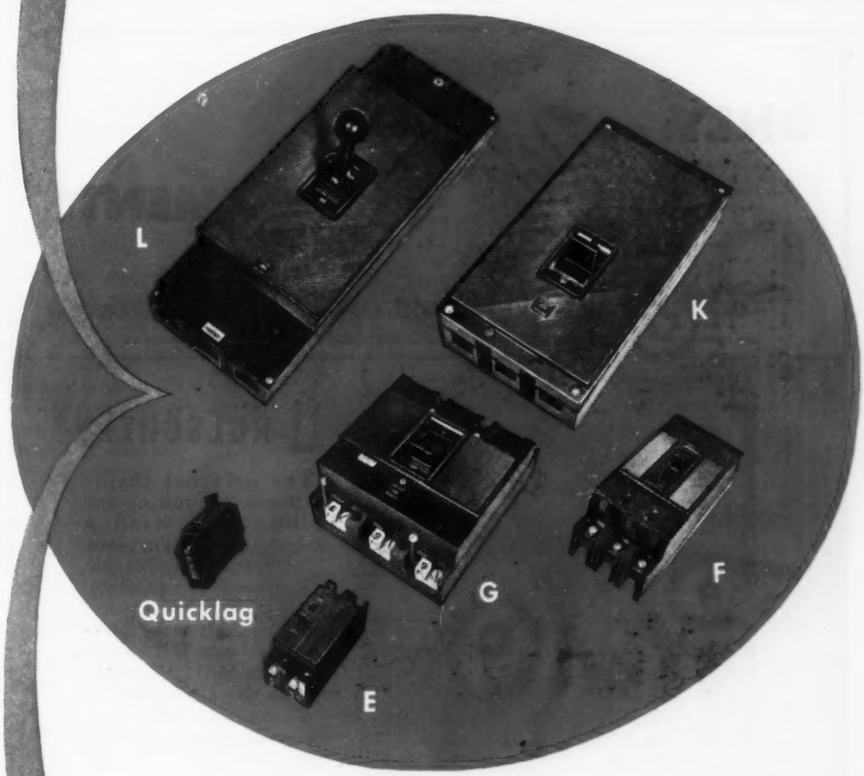

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Reviews

(Continued from page 126)

cattle docks; also rebuild the existing bridge with better approaches, and erect a new high-level bridge lower down the river which will carry off east-west traffic so it need not go to the city's center. This bridge also will serve as link for city and airport, the latter to be doubled in size. The banks of the Lagan will then be developed for beauty as a fitting entrance to the Province of Ulster. Belfast was badly bombed. The Commission assumes that appropriate legislation (War Damage Commission and White Paper on Control of Land Use) will be forthcoming, along with proper financial agreements, to permit execution of this farsighted plan.

June 7, 1945

A school designed by C. G. Stillman in standard bay units provides for the requirements of the three main categories of school accommodations: the classrooms, the practical rooms, and the communal accommodation. An assembly of a number of parts, this type of school building may be plotted on the site, its dimensions specified by bay units. Several possible layouts are illustrated. Only the roof panels on the curved sections of the rambling one-story plan are non-standardized. Structural framework may be of mild steel sections or light steel pressings, in concrete or timber, or in combinations of these.

June 21, 1945

Britishers go staunchly on, getting down concretely to the re-planning of one township area after another. The industrial city of Chelmsford, seventy years ago only a market town, is ready to move its Cattle Market from the center of the city and put to more advantageous use the valuable central land this old landmark now occupies. Lacking the services of the city councils, due to reduced personnel, citizens of the District undertook a survey, financed by three big industrial firms of Chelmsford. Volunteers interested in planning, generally, undertook the research, gathered maps, wrote special-knowledge reports, gave secretarial and publicity assistance. An exhibition of the resulting Chelmsford Planning Survey, shown in sketches and photographs, was held in the city's Shire Hall, in May. It reflected public opinion on town improvement and planning. Recommendation is for long-term planning—no piecemeal development. At no cost to the public, the city group presented this preliminary survey as a gift to the Borough and Rural District of Chelmsford.

July 12, 1945

Three estate layouts are illustrated and described. The first is G. A. Jellicoe's plan for the distribution of 1,546 semi-detached houses, and planting, for Grange Road at Letchworth, an estate of 219 acres in which the road system is exact. More attractive is Gerard K. Cooper's dual access estate study, in which the layout provides for roadways and cycle tracks, footpaths and culde-sac drives to keep motor traffic out of the immediate vicinity of houses. Plots are provided with belts of trees, sun terraces, end-of-drive parking spaces, and a Parkway Promenade to bus stops and schools. House types may vary under this plan.

Clough Williams-Ellis shows a specific plan for coastal extension of a sea-wide village, Moelfre, on the East Anglesey Coast of England. Strict planning control of all building along the coast will be exercised for the safeguard of the existing natural advantages, and certain areas will be left as cliffside sheep pasture. Small island plots will be leased to applicants prepared to build in the best old, local, Welsh tradition.

(Continued on page 130)

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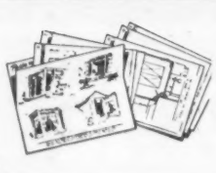

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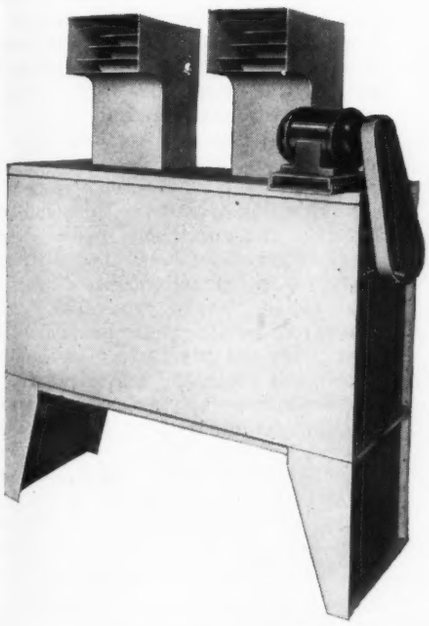

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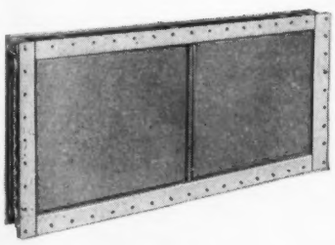

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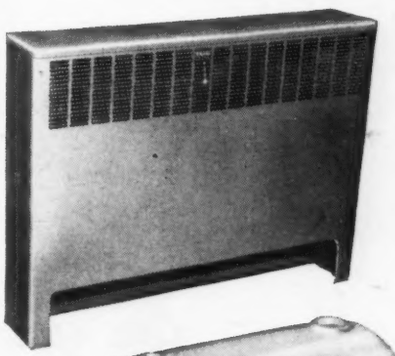

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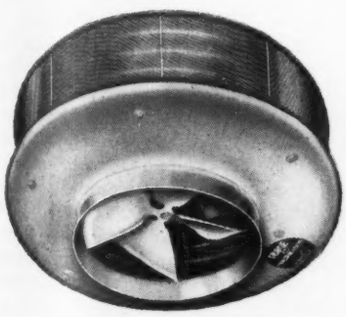

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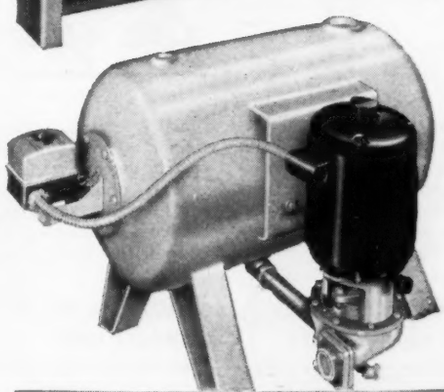

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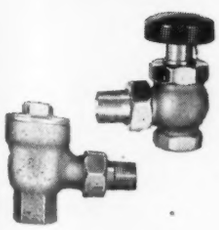

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Reviews

(Continued from page 128)

REVISTA DE ARQUITECTURA
Buenos Aires, South America
February 1945

This issue coordinates seven articles in a discussion of building materials as they have been used in the course of man's building projects. They deal first with wood, its cutting, its grain, its use in rafter and joist construction; as building blocks, in combination with stone and brick, in 20th century prefabrication; and in the making of laminated wood furniture. Among the illustrations from around the world appears "The Witch House," in Pigeon's Cove, Mass., built during the 17th century without benefit of nails. Tombs in ancient Egypt are pictured as the origination of architectural ornamentation. The Greek Parthenon and Gothic cathedral interiors are contrasted with bad examples of stone facing. Brick, "the characteristic material of the Plains," soars considerably above the plains in the majestic and unbroken sides of the towering Mosque of Tabriz. Argentina still uses hand-made bricks, we are told. Examples of steel construction are given, and much space devoted to reinforced concrete, increasingly employed in modern construction—some of it used ornamentally, as on the elaborately adorned exterior of the Church of Saint Teresa in Montmagny.

THE AMERICAN CITY
470 Fourth Avenue, New York 16, N. Y.
July 1945

With the coming of V-E Day, the editors drew large response to a poll of American cities of ten to fifty thousand population, concerning their plans, if any, for war memorials. It was learned that active plans, generally under the initiative of Chambers of Commerce or the American Legion, contemplated anything from a swimming pool to an airport, or a line of trees, with community buildings and auditoriums as most frequent recommendations. Trend is definitely toward "something useful," otherwise called "living memorials," and away from public square memorials, as such. Only the city of La Crosse, Wisconsin, put forth the sentiment that a forest of trees may be neglected and lose its identification with war, while a "granite shaft" would be tended and remembered. Most cities figured a director of activities into the cost. Main funds are to come from public subscription with assistance of the city and, some hope, Federal appropriation.

An actual city and state project is under way in St. Paul, Minnesota. Six million dollars have been appropriated for a State War Memorial Commission to re-do the approach to the Capitol Building. This sum is divided into equal thirds for: acquisition of approximately 60 acres, the construction of a Veterans' Service as a war memorial, and for revision of the street system to fit the plan. The twenty acres now involved in Capitol and other state buildings will be expanded in a fan-shaped area running out in front of the Capitol. It will cause the razing of tenements, boardinghouses, saloons, etc., built before the day of survey (prior to 1849) on the staked-claim system of city planning. Published proposed plan looks very handsome, and no more drastic than natural city improvement should in time require. However, the act which created the State War Memorial Commission provides that the Commission shall advertise a contest for the design, throwing it open to all comers, with no restriction of ideas.

THE AMERICAN HOME
444 Madison Avenue, New York, N. Y.
August 1945

Recognizing the popularity of the Cape Cape style for homes in America, editor Jean Austin presents ten existing homes

(Continued on page 132)

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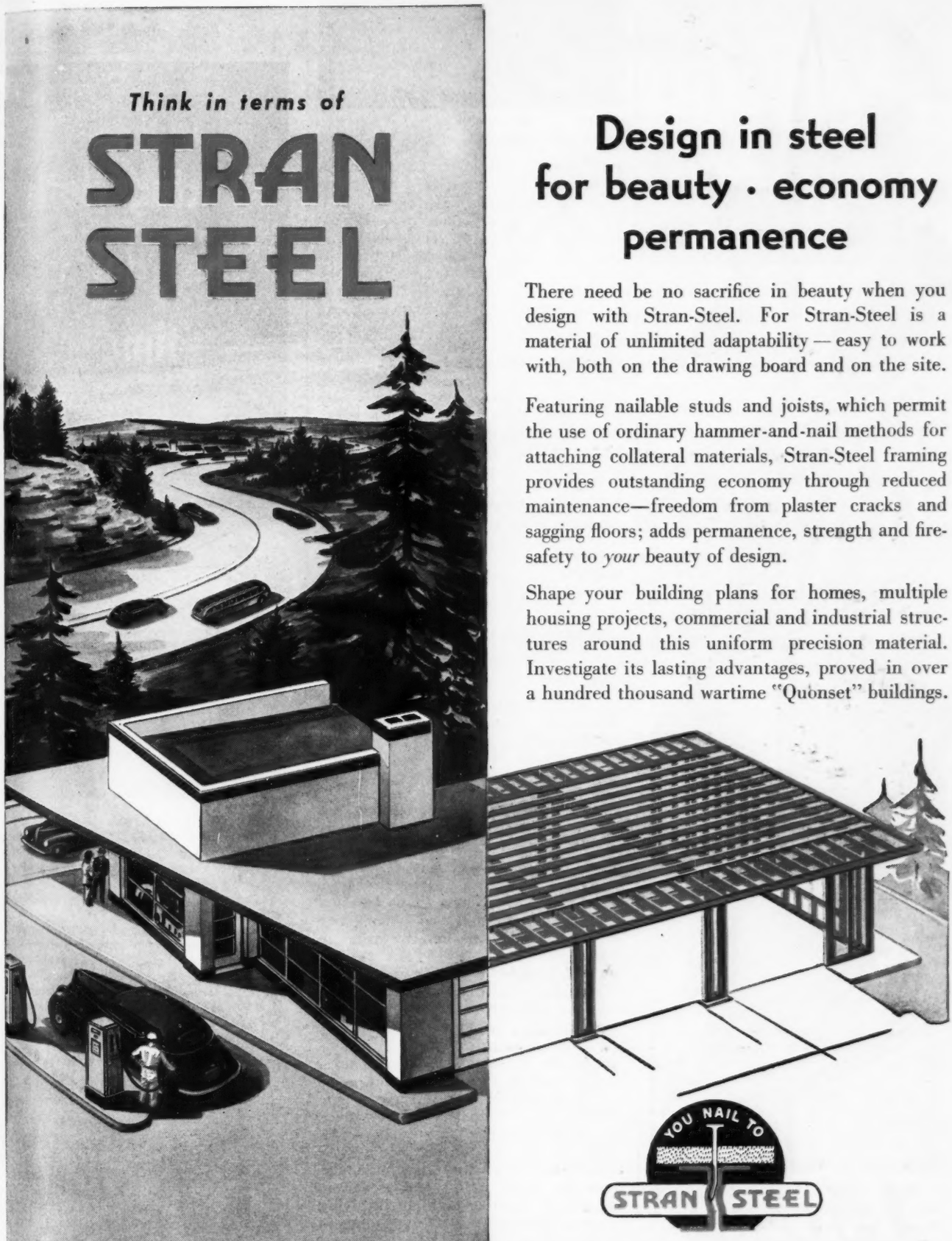

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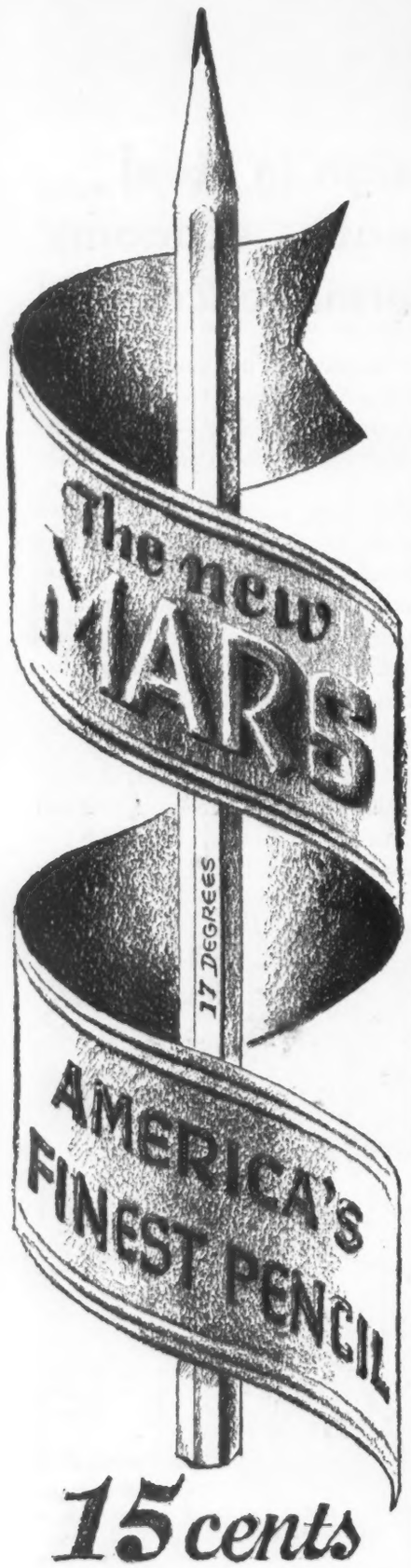

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Reviews

(Continued from page 130)

built on variations of the Cape Cod idea —"the idea indestructible"—as the article is subtitled. They reach from Connecticut to Arkansas and Illinois (mainly) and on to Hollywood and Oregon's wooded sections. It becomes increasingly difficult to recognize the family tie that binds a cedar shack in the northwest with a Springfield, Mass., defense house or a Highland Park three-bedroom dwelling built on three levels. Strangest cataloging of all is the stone-and-shingle farmhouse with gabled roof, belonging to a Dr. Dewey and his wife for whom, apparently, it just grew, thanks to madame's heirloom furnishings and the doctor's talent for refinishing and repair. With the exception of the latter, the houses seem backward and homey, inconvenient but simple, and built, as Joseph Hudnut is quoted as advocating, with: "good manners, common sense and love—out of human hearts" . . . . but clearly not out of a sense of fitness.

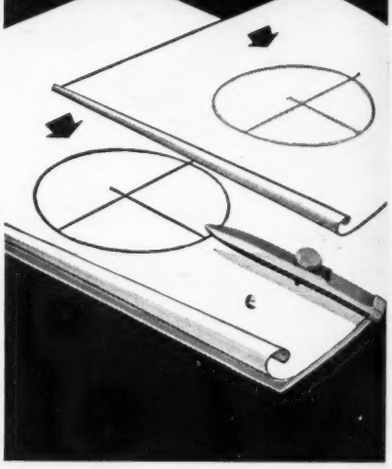
HOUSING PROGRESS
95 Madison Avenue, New York 16, N. Y.
Spring 1945

A new quarterly which calls itself a "brass-tack, down-to-earth magazine," dealing with practices and principles governing the building, managing, and maintaining of America's large-scale community developments, makes its debut with this issue. Facts, with figures, are given on New York City's housing plans for postwar, some of which are now in operation, in an article by Lee E. Cooper, real estate editor of the *New York Times*. Plans for slum clearance and improved community building are astonishingly large in scope, will be done by FPHA (to the tune of $132,500,000); by the Metropolitan Life Insurance Co., largest private project (at two-thirds of a national program involving $200,000,000) for developments similar to Parkchester, in the Bronx; by savings banks, now permitted to invest in, organize and operate dwelling projects; by the City Housing Authority, whose bonds are legal investment for public bank deposits; by the Jacob Riis, Peter Cooper, and other well known foundations for social relief and elevation. Already in sight is building involving the demolition of 15,000 slum units in Greater New York.

Housing Progress, which editorially describes itself as non-political and non-controversial, proceeds to consider such positive building problems as the disposition of 700,000 war dwellings, Federal Government-owned; the dignifying of property management, no longer just

(Continued on page 134)

Tracing cloth that defies time



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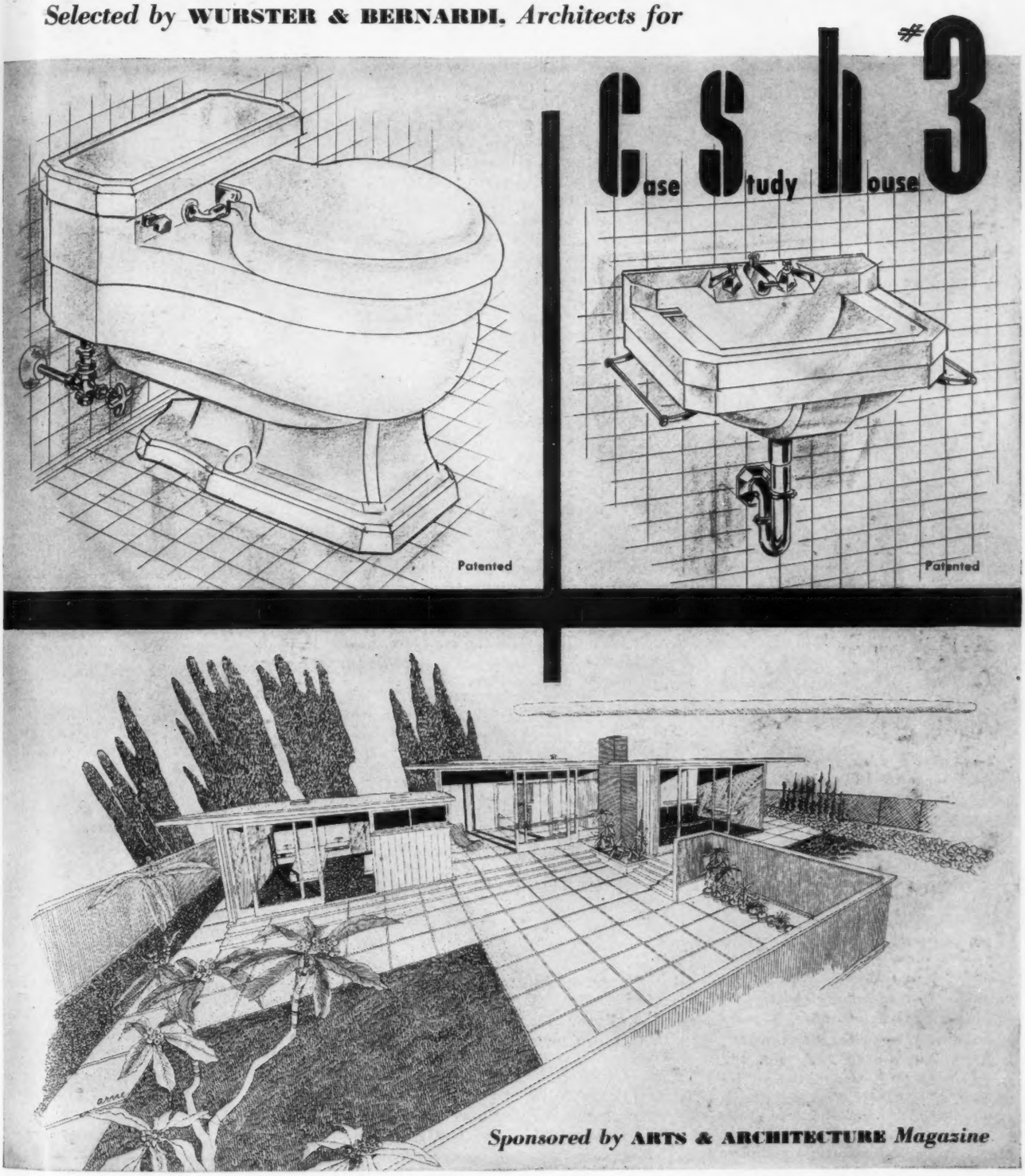

Leading architects are giving special attention to the mechanical equipment of tomorrow's buildings. A minimum of care and upkeep is essential—one of many reasons why Case plumbing fixtures are so widely preferred.

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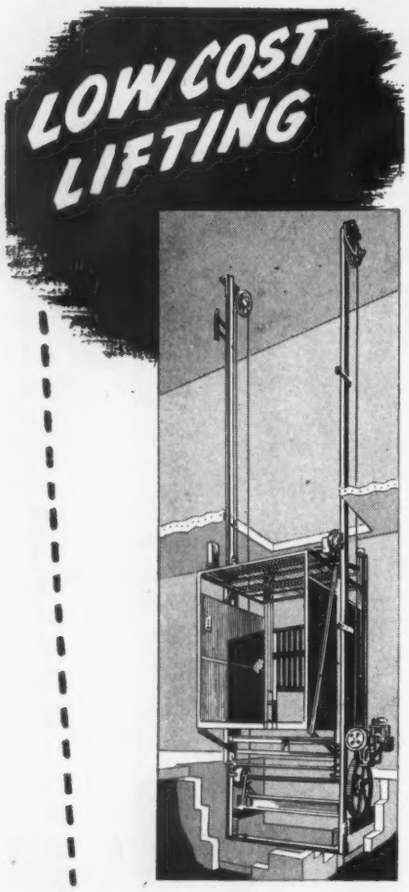
TOP RIGHT—Concealed front overflow, anti-splash rim, chrome finish accessories and convenient shelf are popular features of the *Cosmette* lavatory. Available also with adjustable legs.



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Reviews

(Continued from page 132)

a rent collector's job; the part private builders will play in furnishing low-cost housing; and a profile of John B. Blandford, Jr., administrator of the National Housing Agency. Articles in this issue are written in spirited and enthusiastic style, although giving close attention to figures and statistics. Its advent is timely; its need self-evident, according to the information contained herein, regarding the fast-pace program of building in prospect in the U. S. A.

NOTICES

SCOTT WILSON AND FRITZ FOORD announce their entrance into partnership, with offices at 4 East 53rd St., New York, N. Y.

THEODORE L. PERRIER announces the reopening of his office at 418 Carondelet Building, New Orleans, La., for the practice of architecture.

MELVIN L. AND HARRY A. KING, Architects, announce the removal of their offices to 402 Herald Building, 332 S. Warren St., Syracuse 2, N. Y.

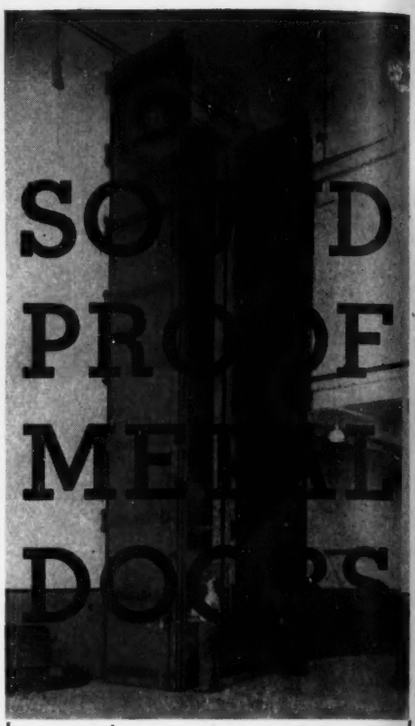
HUGH A. KELLY—B. SUMNER GRUZEN, Architects-Engineers, have opened a branch office for the practice of architecture and engineering at 220 Broadway, New York, N. Y.

PRENTISS & CARLISLE CO., INC., have opened offices at 234 Middle St., Portland, Maine, for the practice of architecture and engineering.

WILLIAM EMMETT BURK, JR., announces the reopening of his offices at 203½ W. Gold Ave., Albuquerque, N. Mex.

PAUL W. JONES, formerly a practicing architect in Minnesota and North Dakota, has formed a partnership with ARQUITECTO RAMON CORONA with offices at Monte Libano #670, Lomas de Chapultepec, Mexico City.

MONAHAN & MEIKLE, Architects, 255 Main St., Pawtucket, R. I., announce that CARL F. JOHNSON is now a member of the firm.



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